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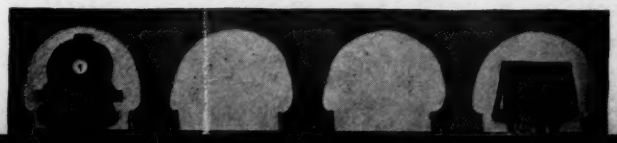

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WILL ENGINEERS BE CODED?

Objectionable Features Endanger Approval

Basic Principles at Stake

MORE than two months have elapsed since the American Society of Civil Engineers invited collaboration in the preparation of a code, applicable to that part of the engineering profession which can be considered as comprehended by what has been termed the Construction Industry. On October 9th a public hearing upon the proposals was held in Washington.

To many engineers coding is something that should be carefully avoided; to some it is a matter of indifference, and, to others it offers the greatest possible benefits that the profession can hope for. Such varying attitudes preclude a unanimity of effort as well as a concurrence of opinion upon proposals set forth by any group. However, the opportunity to render a real service to the profession can hardly be questioned. If nothing more than conferences resulted, the need for a national leadership has been made so obvious as to suggest a new organization, if the existing ones cannot, or will not, accept one of their own for the role, or, consolidate for the purpose of serving the interests of the profession as a whole.

That the questions of representation and compensation were, are, and always will be, fundamental propositions that must be agreed upon, needs no demonstration. Yet, today, a code, acceptable in principle to practically all engineers who favor being coded, and establishing the machinery for eliminating age old abuses and evils, seems doomed because of the failure to secure agreement upon the very premises which justify the procedure.

The purposes of the National Recovery Act cannot be set aside or neglected, without inviting the defeat of any proposals. The objective of coding is to afford opportunity for a decent livelihood to those who, willing to labor, find themselves prevented by the selfishness of mankind. As in every industry, the lower rungs comprehend the great majority of the calling and are, and always have been, most in need of protective measures.

It is difficult to believe that any American, actuated by the spirit upon which the success of N. R. A. must depend, would for a moment presume to code others, without according them a voice in the proceedings. Yet, in so far as it applies to Engineering Assistants, such has been the procedure in formulating the code submitted. Throughout the deliberations the New York State Society has pleaded for a code that would be acceptable to all who would come within its province. To date its appeals in this direction have not been entirely successful, and, in conference its recommendations upon the very vital matters of representation and compensation have met with but slight recognition. The result is that sufficient opposition has been developed to make questionable the adoption of any code.

The proposals, upon which a hearing has been requested, contain so much that is of benefit to the engineer that defeat would be a great misfortune. The New York State Society has contributed a great deal to the present draft, and, had its recommendations relevant to the fundamental propositions above referred to been accepted, there is little doubt but that most of the criticism would have been stilled and a fairly united front presented at Washington.

The proposed code is not set up along the lines which the State Society would have adopted in framing so important a document. It is somewhat provincial in expression. Its phraseology is, in many instances, cumbersome and, because of attempted elaboration, permissive of conflicting opinion. However, the collaborating groups were confronted with the alternative of rejecting the efforts of the committee in Washington which had followed the rather crude phrasing of the first draft of the proposed Architects' code, or, accepting the same as a preliminary instrument for revision. The latter procedure was decided upon, and the present draft has been so modified from its original form as to merit further deliberation, in the hope of incorporating recognition of the basic principles without which it cannot function, before rejecting the same. With the basic

(Continued on Page 12)

REVISED ENGINEERS' CODE

As Submitted for Public Hearing

Corrected to September 18th

THE Engineers' Code, revised as of Sept. 18th, is printed herewith together with a letter from Mr. Geo. T. Seabury to the members of the Committee which considered the original proposals.

The position of the New York State Society of Professional Engineers is outlined in the communication of President Chapman at the end of this article. The said communication embodies the objections of the Society.

All Engineers and Engineering Assistants are invited to forward their approval or disapproval, either of the Code or of the objections of the State Society, to the headquarters of the latter at Grand Central Terminal, New York, N. Y.

September 18, 1933.

Dear Sir:

Enclosed is a copy of proposed "Code of Fair Competition for the Professional Engineer Division of the Construction Industry" dated September 18, 1933, and identified as "Further Revision for Public Heading."

Having learned that the Code as drafted under date of September 8th had not yet been printed by the N. R. A., and, in the light of certain interpretations, the Code has been subjected to this further revision, which in general has the character of removing those parts which at this time are not vital, with the expectation that in so far as they shall later become vital they may be incorporated in the schedules, more particularly of charges, for which provision is made.

Especially is this true with respect to what was formerly Article VI, but it is applicable also to certain portions of the preceding Article V. The deletion of these, permitted a rearrangement of the paragraphs which have been retained.

In general, the changes on former Pages 1 to 6 inclusive, are only very slight, but, on the pages formerly 7, 8 and 9, are considerable. The changes are, however, largely of deletion rather than changes of content.

It is expected that the "Code" will be printed in this form by N. R. A. and subjected to public hearing.

Very truly yours,
GEORGE T. SEABURY,
Secretary.

CODE OF FAIR COMPETITION FOR THE PROFESSIONAL ENGINEER DIVISION OF THE CONSTRUCTION INDUSTRY

PREAMBLE

The American Society of Civil Engineers, organized in 1852, a national association representing the Profession of Civil Engineering, pursuant to the intention of the Engineering Profession, in so far as the practice of the engineering profession is a function of the Construction Industry, to cooperate with the President of the United States in effectuating Title No. 1 of the National Industrial Recovery Act, during the period of the emergency, hereby recommends and submits for approval pursuant to Section 3 of said Title, the following Code of Fair Competition covering relations between professional engineers, clients or employers, employees and others in respect to all construction work; this Code having been approved by duly authorized representatives of the following professional engineering organizations:

In submitting this Code for the approval of the President and in tendering their agencies for the enforcement thereof, the American Society of Civil Engineers and the other organizations indicated above as in approval of this code declare that

a. they are truly representative of the engineering profession in so far as it is functional to the Construction Industry;

b. they impose no inequitable restrictions on admission to their membership;

c. this Code will not permit monopolies or tend toward excessive fees or wages, but will tend toward fair fees and wages, and the eradication of unethical and unfair practices and unfair competition between engineers, and toward the establishment of better professional standards of practice;

d. this Code is intended to eliminate unfair competitive practice and to advance the public interest and engineering standards, and to improve standards of working conditions and living, and effectuate the spirit of the policies set forth in the National Industrial Recovery Act.

ARTICLE I

THE GENERAL CODE

The Code of Fair Competition for the Construction Industry, as approved by the President of the United States, is adopted and made a part hereof and shall be attached hereto, and any provisions of this Code of Fair Competition for the Professional Engineer Division of the Construction Industry which may be inconsistent therewith shall yield thereto.

ARTICLE II

DEFINITIONS AND FUNCTIONS

Professional Engineer

In the meaning and application of this Code a professional engineer shall be considered to be and include an individual, partnership or engineering corporation legally operating in responsible charge of the design or supervision of construction work;

or a person in the employ of the same and who is registered or licensed in accordance with the provisions of law to practice engineering, or any subdivision thereof, within any State or Territory of the United States;

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PUBLIC WORKS POSSIBILITIES

Trade Revival Series of the American Legion

By Admiral Frederic R. Harris

Engineering Advisor to the Mayor of the City of New York

THE place of Public Works and, in fact, all construction is, in the accomplishment of business recovery, a very important one. It is so recognized in the National Industrial Recovery Act. The second part of that famous Act is entirely devoted to Public Works and Congress has, in the act itself, appropriated 3 billion 3 hundred million dollars to defray the cost of Public Works.

Approximately 1 billion 3 hundred million dollars of this appropriation is intended for Federal Public Works, such as public roads, post offices, Custom House and Court buildings and hospitals, as well as the Navy's new warship building program amounting to 238 million dollars. The balance, about 2 billion, is to be used to finance States, Counties, Cities and self-liquidating private enterprises, all with a view of prosecuting much needed construction work that, for the last three or four years, has been either stopped or neglected.

It is only fair to say that there are two schools of thought on the question as to whether it is desirable in a depression such as we have gone through for a National Government to embark on a huge Public Works Program. There are outstanding men, such as Alfred E. Smith, who, over a year ago, advocated an immediate appropriation of 5 billion dollars for this purpose. Again there are others such as former President Hoover, and Mr. Runciman of England who are opposed to national Public Works Programs, because they say a nation cannot pull itself out of a depression by its own boot-straps, and that a huge appropriation of public works will only result in big increases in the national debt and national taxes, with but little effect on the revival of business.

It must be conceded, as with so many things in life, that there are merits to both arguments, and that merely resorting to a Public Works Program is not in itself enough, but that such program coupled with other measures will, if properly handled, prove beneficial.

The N. R. A. in its first part predicates the philosophy that for the time being, cutting out destructive competition, raising wages to increase purchasing power, and dividing up the work, by cutting down the number of hours each person is to work, has more than a fair chance of success.

In addition to the above there is the inflationatory legislation, which puts into the hands of the President the power to adjust equities of debts by decreasing the value of the dollar, and while to date he has not resorted to the great powers entrusted to him, the very fact of their possible invocation has resulted in increase in prices that have stimulated purchasing power.

If one goes back before the days of the depression, he will see that the building and construction industry, Federal, State, Municipal and private, amounted to over 9 billion dollars a year and employed, directly, two to three million human beings, and indirectly several times this number.

It is well to realize that one man working on a job—a brick-mason, a cement worker, or a carpenter, gives employment to other men working in the clay pits, the brickyards, the cement mills, the forest and the lumber mills, and they, in turn, give employment to the truck driver, stevedores, railroad workers and so on down the line.

There is a wide difference of opinion as to the relation of direct and indirect employment. Some claim every man employed directly secures employment for three men in connection with the materials needed. There is another uncertain element and that is: how much employment these men working directly and indirectly give in turn to the butcher, the baker and the candle-stick maker.

After 1929, when the vicious circle that follows in the trail of business and financial collapse, first struck us, economies in Government, Federal, State and Municipal, were urged by the hard-pressed taxpayers, who, in turn, to avoid bankruptcy and the sheriff, tried to economize. Their cry was—we have too many buildings, too many hotels, too many apartment houses and too many industrial plants. The result was that private construction stopped and all those earning their livelihood from such sources were without jobs.

Governments responded by a similar curtailment in construction work, which mean that workmen, superintendents, engineers, and others, either lost their jobs or, if retained, had their pay cut and their hours of employment reduced. All this, in turn, affected landlords who could not collect rent, and so could not pay taxes. Grocers, butchers and dry-goods merchants lost customers and wave after wave of compulsory economy and retrenchment followed.

In the case of the City of New York, whose condition is similar to that in other cities, unpaid taxes mounted more rapidly than economies—the gap between receipts and expenditures being bridged by emergency borrowings. At first the money was easily procured at a low rate of interest, because banks and those who had money left had few safe calls for loans, and these City loans appeared attractive. But, as municipal and other budgets became more and more unbalanced and the mounting tide of short-term notes and other borrowings grew, interest rates jumped until finally many cities, counties and even states, could not find money within the legal restriction imposed upon them. The first and easiest economy was to

(Continued on Page 15)

EMPLOYEES' CODE SUBMITTED

Would Cover Technicians of All Kinds

New Group Sponsors Proposals

AN organization recently formed, under the name of the Federation of Architects, Engineers, Chemists and Technicians, has entered objections to the Code prepared at the direction of the American Society of Civil Engineers.

A copy of the Federation's proposals is printed herewith.

CODE FOR TECHNICIANS

This code shall apply in all industries and institutions employing technical professionals and subprofessionals such as architects, engineers, chemists, draftsmen, surveyors, superintendents, fieldmen, laboratory workers as well as all other technical employees in supervisory, consultative or research capacities.

1. No employee technician shall be employed in excess of thirty (30) hours nor more than five (5) days in any one calendar week, nor more than six (6) hours in any one day.

2. No overtime shall be permitted except in cases of extreme emergency. All time worked in excess of the scheduled number of hours shall be paid for at the rate of not less than double time.

3. The minimum rates of pay for employees covered by this code shall be:

Senior Technician—sixty-five ($65.00) dollars per week.

Junior Technician—Forty-five ($45.00) dollars per week.

Technical Assistant—Thirty-five ($35.00) dollars per week.

Apprentice—Thirty ($30.00) dollars per week.

The grade titles employed here are arbitrary. All wage and grade classifications shall be based upon the professional or sub-professional experience qualifications.

The title Senior Technician shall apply to one who has graduated from an accredited college or professional school and has received degree in a recognized technical course and has in addition six (6) years of experience in his profession, or to one who has had ten (10) years of experience in his profession.

The title Junior Technician shall apply to one who has graduated from an accredited college or professional school and has received a degree in a recognized technical course and has in addition one (1) year of experience in his profession, or to one who has had five (5) years experience in his profession.

The title Technical Assistant shall apply to one who has graduated from an accredited college or professional school and has received a degree in a recognized technical course, and has had no practical experience.

The title apprentice shall apply to any one employed to do the most elementary technical work, and has had no experience, or training of a professional or subprofessional nature.

The above minimum rates shall not be interpreted as fixed rates for the various grades and the amounts by which wages of the higher priced classes of workers in the various grades exceeded the lowest paid in the corresponding grades shall be maintained.

These minimum wage rates are to be guaranteed irrespective of the basis of the employers compensation.

The ratio of senior technicians to the lower grades in any plant of any of the professional classifications in this code, shall be fixed by the joint committee provided for in this code.

4. Any system of subcontracting work by which an employee undertakes to do a piece of work at a specified price and engages other employes to work for him at rates lower than the minimum specified in this code, is prohibited by this code.

5. Every technician shall be given two (2) days vacation with full pay for every month of employment, but in no case shall the vacation period of any employee classified in this code be less than two (2) calendar weeks.

6. In the event of discharge, technicians shall be given two (2) weeks notice with the privilege of seeking employment during that full period.

7. Employees shall have the right to organize and bargain collectively through representatives of their own choosing and shall be free from interference, restraint or coercion of employers of technicians or their agents, in the designation of such representatives or in other concerted activities for the purpose of collective bargaining or other mutual aid or protection. No employer or any agent of an employer shall take any part in organizing the employees in his plant or plants in competition with or as a substitute for any labor organization or association dedicated to the economic interests of technicians that employees may hereafter deem it desirable to form.

8. No employee and no one seeking employment shall, as a condition of employment, be required to join any company union or economic organization or association or to refrain from joining, organizing or assist in organizing a labor organization or economic association or conducting the affairs of such an organization. Nor shall there be any discrimination in hiring any workers on account of having reached any age limit if the workers are otherwise competent and efficient.

9. To effectuate the execution and enforcement of this code there shall be established a Joint Standing Committee equally representative of the labor and economic associations of technicians and the trade industrial or employers' associations. By

(Continued on Page 16)

City Government Reorganization

A Proposal for New York

Would Adequately Recognize Engineers

By Arthur V. Sheridan

CONTINGENT upon the outcome of the election of November 7th, the City of New York will begin consideration of a new Charter. In the making of a modern municipal governmental structure the engineering profession should play an active role.

The engineer, as the creator of modern communal existence, should advocate governmental reorganization and be prepared to offer concrete proposals.

Several Chapters of the New York State Society, in the Metropolitan Area, have appointed committees for the purpose of considering Charter Revisions.

The following, prepared for and delivered in the form of an address in 1930, is offered with a view to stimulating interest and criticism pertinent to a matter of the greatest importance to the engineer. What transpires in New York may be a powerful influence in the determinations of other cities.

Suggested Reorganization of the Government of the City of New York

The problem of government is as old as civilization. Like civilization it changes. As man's existence becomes more complex government becomes more complicated and modern society requires governmental agencies and ramifications undreamed of by the great rulers, statesmen and philosophers of the past.

For an engineer to discuss such a problem as government is perhaps a strange and unusual evidence of temerity. But after all government is and always has been an experiment. No enduring criterion has yet been developed. The part that the engineer must play in a civilization which he, more than any other, has created, should serve as an extenuation for entering the domain of public affairs.

Much has been written upon the subject of government by historians, political economists, sociologists, philosophers, lawyers and others who concern themselves with such matters, but despite the fact that one finds many texts and dissertations upon what is frequently called the science of government the only conclusion that can be obtained therefrom is that government is not a science. It has changed in every age, differed with every race and nation and continues to be a source of endless controversy. Throughout history we find that it resembles a great river on its way to the sea. It ebbs and flows, is lost in the maelstrom of human events, is absorbed and reappears as a virgin rain of old ideas in new forms.

Even human laws follow the same indefinable course. As far back as 1400 years B. C. or thereabouts we find Moses rewriting and codifying the rules of life; some 800 years before the Christian Era Lycurgus set into definite form laws that were to live for a thousand years. 100 years B. C. Caesar set about a codification of the Roman Laws; over 100 years later Justinian actually consummated the dream of Caesar. In 850 A. D. Alfred the Great compiles the laws of Saxon, England, and early in the last century Napoleon codified and promulgated laws that still serve the continent of Europe, South America and other parts of the world. There never was, in the speaker's opinion, greater need for a codification and return to a sane approximation of the idea that it is the spirit rather than the letter of the law that should prevail than there is today in America, where laws are ground out in machine-like fashion in countless numbers every year, resulting in inevitable conflict and contradiction. It is these countless laws that make difficult efficient and adequate government and history shows that Republics suffer most from over-legislation. After all the Decalogue is still the most perfect set of laws ever devised for the well being of mankind, and an occasional reflection thereupon might extend the usefulness and life of Republics—who, as history shows, have a penchant for substituting new laws for the spirit of old ones in a vain hope of stemming a prevailing tide of evils resulting from failure to observe the spirit of those laws that already exist. However, these remarks are aside from the present issue which concerns the Metropolis of the Western Hemisphere.

The City of New York, as a political entity, and a most important one, has developed, over a period of time, a form of government for its affairs that is clumsy, unwieldy, impossible of efficient administration and no longer adequately representative.

The growing tendency, made necessary by the difficulty of administration, is to centralize authority. No one will deny that a strong centralized control in the hands of a benevolent and enlightened despot permits the nearest approach to the ideal state, but our form of government is predicated upon the assumption that for one Lincoln there are perhaps a dozen Neros and a thousand mediocrities.

For some years the City of New York fought for and finally secured in a large measure the right to be guided by the wishes of its citizens, unhampered by the insistent opinions of outsiders, in conducting its affairs.

What is here proposed is an extension of this

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TECHNOCRACY

Plan Adopted

By Continental Committee on Technocracy,
July 4th, 1933

FOREWORD

CIVILIZATION today surrounds Man with the same Fear which obsessed the First Man on his First Day, the Fear of Hunger, and it has added to that an equally terrible Fear of Loss. No degree of wealth, nor height of position, can assure a Man of Personal Security under the present economic system. Schemes of finance may lead a Man to Feel Himself Secure but he cannot know that his children will be immune to want. Civilization today is threatened with collapse because the increasing insecurity of its units is making sand of its foundations.

Technocracy, product of scientific study, offers to Man, for the first time in his existence, Release From Fear. It ends Greed, assures Abundance, and builds life's premiums upon culture. Freedom! That is the object of this plan, the first True Freedom that Man has ever known. Freedom from Worry over the physical necessities of life for himself and for all who may depend upon him. Freedom! Today, Tomorrow, and Forever!

GEORGE VAIL STEEP.

I. INTRODUCTION

Man, by means of science, has finally solved the problem of production. By harnessing the forces of nature and substituting the energy thus produced for human energy, goods of nearly every kind can be produced in desired quantities. Today in America farms are producing sufficient food for all, and factories are equipped to turn out manufactured articles, clothes and building materials as well as typewriters, radios, automobiles, books, and other commodities to meet every need. Yet more than forty million men, women and children are destitute and exist on the sufferance known as charity. Countless others live in fear that they too will be forced to join the bread line. Instead of providing security and plenty, the power driven machine, as used by the price system, has neither banished poverty nor relieved distress.

Obviously men need not be hungry when foodstuffs are allowed to rot, wear rags when the government urges farmers to plow under approximately one-third of their cotton, live in hovels or sleep on park benches with vacant buildings everywhere. The problem of production is solved, but abundance of goods to the individual has not resulted under the present system.

Since the price system fails to deliver the goods to the individual even when goods are plentiful, our present economy with its price control based on the assumption of scarcity, must be replaced by a new economy founded on the fact of plenty. Again a pioneering task must be undertaken. The people of this continent face an emergency upon which the fate of civilization depends. Evasion will mean the collapse and destruction of our society.

This paradox of want in the midst of plenty exists under the price system, because, after production has reached a certain point, the more society produces, the less the individual receives. Distribution under the price system depends upon buying power. Buying power, whether it is derived from wages, interest or any other source, depends upon profits. Unless profits are realized, neither interest nor wages can be maintained. Profit is the difference between price and cost. When an article is produced in such abundance that supply exceeds purchasing power, the difference between price and cost becomes zero, or a minus quantity. The article, therefore, sells at cost or less. This has been the case with basic commodities such as wheat, corn, cotton, rubber, sugar and other items during the last few years. As a result, profits are replaced by losses, wages and interest cease, men are thrown out of work, businesses, institutions, cities and governments become bankrupt, distribution is obstructed and retarded, the wheels of progress stand still.

Such a system is irrational, obsolescent and leads only to chaos. Instead of buying power depending upon profits which disappear when goods are in ample supply, buying power should depend upon productive capacity. In such an economy, the more society produced the more the individual would have for consumption. This is the essence of Technocracy.

Civilization has advanced whenever scientific methods have been introduced into a field of study. Technocracy plans to apply the scientific method to the distribution as well as to the production of goods and thereby to unite production and distribution into one even-flowing process.

Patching up the present system by inflating the currency on the one hand and controlling production on the other, succeeds in putting billions of dollars of purchasing power into the hands of Wall Street and other speculators, only a fraction of which seeps down to the wage earners. If the stimulus of inflation can be continued long enough, a few of the unemployed may be reemployed for a short time. However, as soon as inflation has run its course, a new dislocation of prices will again upset the distributing system, a new mountain of debt will arise, and another period of general destitution and suffering will follow. Inflation cures nothing, and curtailing production while a part of the population lacks the essentials of life, is as criminal as it is stupid. A new system is needed which will distribute the product of man's ingenuity and release our competent technology for the benefit of mankind.

The population of the United States can be provided with a standard of living far higher than any nation has ever had. In fact, within a few

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THE PROFESSION IN AUSTRALIA

Problems and Activities of Engineers

By John Robert Kemp

THE following excerpts from the address of President Kemp delivered at the 12th annual general meeting of The Institution of Engineers of Australia indicate that the problems of the engineering profession are more or less universal and that means of solving them are taking shape in various parts of the world. As in the United States and in Canada it is becoming obvious that licensing offers the only apparent solution so far advanced. The quickest and most certain path to public recognition is through legal recognition.

The preparation of this address has been fraught with some difficulties, in view of the fact that the subject which interests me most in engineering is one to which special attention is being given at this Annual Engineering Conference, namely road engineering; and as it is usual for a President in his address to devote a portion thereof to a discussion of the subject in which he is most particularly engaged, I have deemed it advisable to confine my remarks to those portions of the subject which are unlikely to be touched upon at this Conference, or by the Road Construction Standing Committee of the Institution, which has prepared a considerable amount of matter during the past years for publication in The Journal.

* * * * * * * *

THE INSTITUTION

Before, nowever, proceeding to a discussion of this matter, it appears wise to look back upon some of the records of the Institution now that we have passed our first decade—this so that we shall not forget the work of those who laid the foundations of the Institution. And thus be stimulated to even greater future efforts. Volume I of The Transactions, containing many interesting records, is not in the possession of very many of our members since the membership has increased from a total of 1,758 in 1920 to 3,393 in 1931.

On 21st October, 1919, the first Council of the Institution met, and to quote from the First Volume of The Transactions—"The Institution of Engineers, Australia, entered upon its career with assured strength, having in each State of a Commonwealth a Division formed of one or more Foundation Societies." It was indeed fully entitled to be regarded as a National Institution. Its first President was the late Professor W. H. Warren, one of the most distinguished of Australian Engineers, and its Honorary Secretary, Mr. D. F. J. Harricks, has since been honoured with the Presidency of the Institution. The Provisional Council had framed a Constitution which stands today as the firm foundation upon which our structure has been built, and which is a monument to the various Societies representing all branches of engineering, who had the broad vision necessary to take such a momentous step in the history of the profession in Australia. Whatever may be the "vox populi" today in regard to Federation of States into a Commonwealth, the unanimity of thought and action amongst engineers is much greater than it ever was before our Federation. As the result of the pioneering work done before 1920, the Nation had undoubtedly received great engineering benefits, and that should mean great general benefit. Looking down the record of the Institution as inscribed in later Transactions, it is obvious that the burden of administration has fallen upon a comparatively few members, who have most willingly carried out their duties for our common good. The loyalty and great interest of members generally has been the vital force guiding the administrative work of Councils and Divisional Committees. The officers, too, have creditably performed their functions, and we have special reason to congratulate the Editor of The Journal for the standard realised. The autonomous nature of the Divisions has been well maintained throughout their committees and officers. It is well worth while for men as far apart as Brisbane and Perth (nearly 3,000 miles), to be able to meet, exchange views and garner knowledge at a convention such as this, and at all times to be kept in touch with each other through The Journal.

The record on the educational side is necessarily confined to men gifted with a facility for conveying to their brothers the results of their mathematical, scientific and practical work, and is one of which we and they should feel proud. We possibly cannot feel quite in the same way with regard to recorded discussions upon the papers which have been read and published, or the criticism which has been recorded, since this has been all too scanty. Discussion is the salt-giving savour to the food presented to us: the publication of The Journal in its present form is promoting this much needed discussion.

The original Societies which amalgamated to form the Institution were: The Institute of Local Government Engineers of Australasia; The Electrical Association of Australasia; The Melbourne University Engineering Society; The Engineering Association of New South Wales; The Northern Engineering Institute of New South Wales; The Queensland Institute of Engineers; The South Australian Institute of Engineers; The Sydney University Engineering Society; The Tasmanian Institution of Engineers; and The Western Australian Institution of Engineers, and, in 1926, the Institution of Municipal Engineers of Victoria was absorbed. Originally seven Divisions were established, and a new Division, Canberra, has since been formed, whilst a number of Branches of Divisions has come into being in Sydney and Melbourne, all creating new problems in administration. The connection of the Institution with the work of Standardization

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General News And Comments

Informative Items

NEW YORK LEGISLATION FOR 1934

D. B. Steinman, Chairman, Board of Trustees

A preliminary draft of desired amendments is submitted for consideration by the members of the Society.

CORPORATIONS, FIRMS, PARTNERSHIPS AND JOINT STOCK ASSOCIATIONS
(To supersede Section 1461)

No corporation shall practice or offer to practice professional engineering or land surveying in this state or be granted a license under this article; except that it shall be lawful for a corporation organized and existing under the laws of the state of New York, and which on the fifteenth day of April nineteen hundred and thirty-four was practicing professional engineering in this state, to prepare designs, drawings, plans or specifications for buildings, structures, machinery or equipment which are constructed or installed or their construction or installation supervised by such corporation, provided that the chief executive officer of such corporation in the state of New York shall be a licensed professional engineer under this article, and provided further that all employees of such corporation who are operating in this state and are doing responsible professional engineering work or bearing the designation or title "engineer" with or without qualifying word shall be licensed professional engineers under this article. After the date named in this section, no corporation shall be incorporated in this state to practice professional engineering or land surveying, nor shall any new corporation be permitted to assume a corporate or trade name involving the word "engineers" or "engineering" or any modification or derivative of such terms. No unincorporated firm, co-partnership or joint stock association shall practice or offer to practice professional engineering or land surveying in this state, or use any designation, description or trade name involving the word "engineers," "engineering," "surveyors" or "surveying," or any modification or derivatives of such terms, unless each and every member of such firm, co-partnership or joint stock association is a licensed professional engineer, or respectively a licensed land surveyor, under this article.

CONSTRUCTION OF THE ARTICLE
(To supersede Section 1461)

Nothing in this article shall be construed as prohibiting licensed professional engineers from making and plotting surveys other than land surveys, nor from making and plotting land surveys where such surveys are essential to engineering projects. Nothing in this article shall be construed as prohibiting licensed land

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MUSEUM OF SCIENCE AND INDUSTRY

Dr. Calvin W. Rice Comments Thereon

The New York Times of recent date published the following editorial which merits the attention of Engineers. Wealthy ones, if there be such in our present civilization, are urged to consult with Dr. Rice, who has sown the seed for reflection.

WANTED: A FOUNDER

Calvin W. Rice, Secretary of the American Society of Mechanical Engineers, in a letter to The Times a few days ago expressed "a profound feeling of respect and admiration "for the generosity of private citizens of Chicago in making possible an array of museums rivaled only by government-supported institutions in the largest European capitals. Men of wealth have given perhaps more generously here in New York to educational institutions than in any other city. But there is one notable lack. New York has not as yet such a museum of science and industry as Chicago has in partial operation and more fully in prospect.

We have made a beginning, however. "The Museum of the Peaceful Arts," reorganized as The Museum of Science and Industry, under the presidency of Frederic B. Pratt and the directorship of Charles R. Richards, is housed in a building at 220 East Forty-second Street (where it occupies a whole floor) and suggests what such a museum might bring in practical and cultural values to millions, if it had an ample home of its own with adequate endowment. Dr. Von Muller, till lately head of the Deutsches Museum in Munich, has made the best demonstration of the possibility of building up such a museum, even with modest expenditure, for many of the exhibits illustrating the evolution of the present-day machines and processes are available without expense. Austria began a museum of this character in the midst of the war, which is a "marvel for beauty and inspiration" as well as a great incentive to progressive invention, and accompanied it with almost no actual expenditure of money. There, as in Munich, workingmen gave of their skill and time, manufacturers gave of their machines, processes and fabrics.

An institution of this type is not "a hodge-podge of mechanical wonders" but an illustrated history of the stages of the evolution through which natural laws have come to minister to man's needs and aspirations. Even children are able to read the story of many of the machines by performing themselves the operations which the race has taken centuries to learn how to devise. Here the cavemen's rude stone instruments of war and peace,

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A. I. S. C. CONVENTION

Chicaga—October 18th

The Eleventh Annual Convention of the American Institute of Steel Construction will convene October 18, at the Stevens Hotel, Chicago, Ill. By that time members of this industry will have been placed under a Code of Fair Competition imposed by the National Recovery Administration. It will be a critical time and a most opportune one for the discussion of the affairs of the industry.

The program of this convention will be so arranged as to afford the best possible opportunity to give those attending authoritative information on their problems. Leaders of the industry will be asked to join freely in the discussion from the floor.

It is expected that some important representatives of the steel industries abroad will be in attendance. They will attend the convention, not alone for their individual edification but also to contribute to the discussions from their own experience. The political experiment in the United States to bring about business recovery is a matter which also deeply concerns our fellow steel producers abroad.

Some of the outstanding technical problems of the industry will also come in for full exposition. During the past few months a revision of the Standard Handbook has been under advisement. A committee has been working on the problem and will be prepared to announce at the convention some of the important changes which are now being contemplated.

Unlike the Convention of last year, the Eleventh Annual Convention is going to welcome the ladies again. With the Century of Progress Fair going on in Chicago at the time it is felt that this is an excellent time for the members to bring their wives and other ladies of their household with them for an enjoyable vacation. Entertainment will be provided the ladies.

At this time, also, plans are being made to memorialize the first skyscraper, the Home Life Insurance Building which was erected in Chicago in 1883-1884. This building was demolished in 1931. The new Marshall Field Building now stands upon the site, and it is proposed to unveil in the lobby of the new structure a stainless steel plaque to mark the location of the first skyscraper ever built. This will be a memorable and unique celebration. It will draw to Chicago a number of important structural engineers and skyscraper architects.

The full details of the Convention are not yet worked out, but the plans have progressed sufficiently to warrant a most informative and most interesting occasion. The Eleventh Annual Convention of the American Institute of Steel Construction will be one no member of the industry can afford to miss.

CHARGES FOR ENGINEERING SERVICES

1930 Report of A. S. C. E.

Incorporated in Proposed Code

The proposed Engineers' Code, as submitted, contains the provision that pending the establishment of State or Regional Committees the schedule of charges as compiled by a special Committee of the American Society of Civil Engineers in 1930 shall be recognized as the minimum compensation for engineering services remunerated on a fee basis.

The importance of this provision warrants the publication of the complete schedule which follows:

TABLE 1.—SCHEDULE OF MINIMUM RATES

Net cost of work not exceeding	Percentage of cost as minimum rate for charges	Remarks.
$ 25 000	9.5	
50 000	8.0	
75 000	7.0	
100 000	6.5	
150 000	6.0	
200 000	5.75	Rates quoted are for work stated to be included in the following "Explanatory Notes," and subject to further charges for field work, supervision, inspection, etc.
250 000	5.50	
300 000	5.25	
400 000	5.00	
500 000	4.75	
600 000	4.70	
700 000	4.65	
800 000	4.60	
900 000	4.55	
1 000 000	4.50	
2 000 000	4.25	

AN EPITOME OF THE REPORT ON CHARGES AND METHOD OF MAKING CHARGES FOR PROFESSIONAL SERVICES FOR THE USE OF CLIENTS

ENGINEERING SERVICE

The basis of compensation of Consulting Engineers is the employment of skilled, experienced talent, and the value to the Client of honest, unbiased opinions and service.

The requirements for engineering advice and service vary widely. The character of engineering service rendered, may extend from brief authoritative opinions based on experience and special knowledge, to complete direction of vast projects involving all the stages of the engineering work in design and construction and oftentimes to general supervision of ultimate maintenance and operation.

The cost of consulting engineering service varies with the education, experience, and professional standing of the Engineer; its value to the Client and the character of the service to be rendered; that is, whether advice is desired on preliminary developments, or the later design and construction, or both.

CONTRACTS FOR SERVICE

Written agreement, either by letter, duly accepted, or preferably in a legal form, should be drawn in respect to engineering services.

This agreement should state:

Precise nature of the service to be rendered.

Character and extent of the work.

Terms and time of payment.

METHODS FOR COMPUTING CHARGES

One of the following methods is generally used for computing professional charges, although modifications of method or some unstated method may be used, if especially applicable:

1.—Percentage of Cost.
2.—Fixed Lump-Sum Fee.
3.—"Per Diem" Rates.
4.—Fees on Hourly Rate.
5.—Salary For Part-Time Service.
6.—Retaining Fee.
7.—Contingent Fee.

METHOD 1: PERCENTAGE OF COST

Fee based on a percentage of actual cost of work contemplated or constructed:

(*a*) For complete service, inclusive of assistance and overhead.

(*b*) For personal service only.

(*c*) For engineering reports or service only (actual cost with percentage added, plus fee for personal service).

For services likely to extend through ultimate construction, the customary and most convenient method is a percentage of net cost of the work, either actual or estimated.

For services that are to terminate with designs and estimates, or at the award of contracts for construction, or an earlier stage, the percentage is based on estimated cost.

In engagements for personal service only, the cost of draftsman, field engineering, and overhead is included in arriving at "net cost."

The items to be included in determining the "net cost" must be clearly defined and provision made for adjustment of payments in case the work should be protracted or delayed.

The schedule, Table 1, is recommended with the understanding that the rates cannot be applied rigidly to all kinds of work or to all locations. The rates are the lowest for average work in the great cities of the United States. The locality can influence the proper rates only in that, by increasing or diminishing the overhead expenses, it may affect the cost of service.

Explanatory Notes.—

a.—Rates do not include cost of surveys, resident supervision, shop, or field inspection of materials or construction. For the average type of engineering construction work the item of cost of resident supervision, surveys, and field engineering will approximate 1½% of the cost of construction, or a much higher figure, depending on the character, detail, and difficulties of the work. Inspection can only be estimated by the engineer in detail in the light of his knowledge of the specific work under consideration. Suitable percentage charges for these items, therefore, must be added to the schedule of minimum rates stated.

b.—Rates include preliminary studies, investigation, and report on the project; preparation of plans; estimates of quantities and cost; specifications; award and execution of contracts; supervising the laying out of the work by the principals; computation of estimates; preparation of working drawings, as well as the checking of working drawings required of the Contractors; consultation and advice to the Client during construction, including, also, the general direction of the work to conclusion.

c.—Rates do not include the cost of borings, soundings, tests, etc., and the expenses of directing such work.

d.—Rates do not include the cost of construction surveys, monumenting and laying out of work in detail, lines and grades (usually in charge of a Resident Engineer), nor field staff, nor camp expenses, as these costs are a part of the work and are accounted additional services to the Owner. The amount of such expense, therefore, is properly included in that on which the percentage rate is applied.

e.—The time occupied in promotion, study, development, and construction, as well as whether the work is spread over a large territory or is localized, is considered in determining the percentage rate.

Percentage rate employment presupposes a reasonable maximum time within which service is to be rendered. Should the time be extended beyond that reasonable period by circumstances for which the Engineer is not responsible, additional compensation should be paid for the added costs, and this contingency should be covered in the contract, usually by adding 25% on salary cost.

f.—In work built under a large number of separate contracts, involving considerable co-ordination over that necessary under a general con-

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Will Engineers be Coded?

(Continued from Page 3)

objections overcome the document, as now written, can, with but minor modifications, be made applicable to the engineering profession as part of any industry. This is vital because the solidarity of the calling, recognized by law in the State of New York, and fought for by the professional society, must not be jeopardized or broken down through the abortive use of an emergency measure that, in its own functioning, predicates unity as an essential of success.

.The failure to give heed to the counsel of the State Society is now bearing fruit. Organized opposition, to the extent of submitting another code concerned only with employees, proposes national activity through the formation of a group comprehending architects, engineers, chemists and other technical workers.

Will the position of the American Society be an enviable one if the code is rejected because of a refusal to recognize the rights of those being coded? Will not a great opportunity be lost; and will there not be justification for the creation of a national group responsive to the opinions of the calling as a whole?

The profession stands in need of a national organization, responsive to the opinions of its membership, and concerned with the social, economic and professional well-being of the engineer. An Association of State Professional Societies, careful in the selection of the national personnel, would fill the required role more adequately than any existing body. If the American Society of Civil Engineers aspires to such leadership it must invite to its ranks qualified electrical, mechanical, chemical and other engineering practitioners and must reform its organization along lines that will make it truly democratic and representative of the opinion of the profession as a whole.

* * *

Revised Engineers' Code

(Continued from Page 4)

or any person admitted to, or eligible by reason of technical training for admission to membership in any national, state or regional professional engineering organization, in grades which require, as a constitutional provision, active practice as an engineer for not less than eight years and responsible charge of engineering work for not less than one year; active practice and responsible charge of engineering when functional to the construction industry to be determined as defined in Article II, of the Constitution of the American Society of Civil Engineers, which reads as follows:

"In considering the qualifications of candidates for Corporate Membership, responsible charge in engineering teaching may be construed as responsible charge ot work. Graduation in engineering or architecture from a school of recognized standing shall be considered as equivalent to four years of active practice and the satisfactory completion of each year of work in such school without graduation shall be considered as equivalent to a half year of active practice. Graduation in a course other than engineering for a college or university of recognized standing shall be considered as equivalent to two years of active practice; provided, however, that no candidate shall receive credit for more than four years of active practice because of educational qualifications."

In the meaning and application of this Code the functions of an engineer shall include the economics of, and the use and design of, materials of construction and the determination of their physical qualities; supervision of the construction of engineering structures; the investigation of the laws, phenomena, and forces of nature; when any of the same are involved or employed in connection with fixed works for any or all of the following divisions or subjects; irrigation, drainage, water power, water supply, flood control, inland waterways, harbors, municipal improvements, railroads, highways, tunnels, airports and airways, purification of water and sewage, sewerage, refuse disposal, foundations or substructures, framed or homogeneous structures, buildings, and bridges; they shall include the investigation of, the design of, and the selection of, the force resisting and load-supporting members of structures; such as foundations, walls, columns, beams, girders, slabs, trusses, and similar members; and the investigation of, design of, and selection of mechanical, electrical, or sanitary component parts of structures; where such investigation, design, and selection requires a knowledge of engineering laws, formulae, and practice, a knowledge of the physical properties of the materials used, and a knowledge of the methods used in their installation; and the supervision and coordination of the design and execution thereof. It is recognized that the functions of an architect include elements of a like nature to the elements included in the engineer's functions. Such normal functions as practised by architects shall not be deemed to be included in the foregoing statement of the functions of an engineer. Such normal functions of an architect being excluded, any one performing any of the above defined services, or undertaking to provide or to be responsible for such services shall be deemed an engineer, subject to all of the conditions of qualification and experience in the above definition of a professional engineer, and subject to all conditions and regulations of this Code.

Where a Professional Engineer registration or license law is in effect, any registered or licensed professional engineer shall be entitled to practice as an engineer but shall not be relieved by that fact from any of the provisions of this Code.

Professional Engineers are entrusted with financial undertakings in which their honesty of purpose must be above suspicion; they act as professional advisers to clients and in collaboration with employers and their advice must be absolutely self-disinterested; they are charged with the exercise of judicial functions as between client and contractor and must act with entire impartiality; they have moral responsibilities to their professional associates and to their subordinates; finally, they are engaged in a profession which carries with it grave responsibilities to the public, and as such, when functional to construction work constitutes a division of the Construction Industry.

Where used hereinafter the word "engineer" shall be construed as an abbreviation of the term "Professional Engineer" as herein defined.

Engineering Assistant.

In the meaning and application of this Code an engineering assistant shall be any person who, not registered or licensed by any state or territory to practice engineering as a profession, and not eligible for membership as hereinbefore defined in any professional engineering organization providing for membership as hereinbefore described, is employed to render technical or other services of a sub-professional nature under the direction of an engineer.

Person.

A person as used herein shall include any natural person, partnership, association, corporation, trust, trustee, trustee in bankruptcy, receiver, or agency.

Client.

A client shall be a person, who engages the services of an engineer on a fee basis.

Employer.

An employer shall be any person who engages the services of an engineer or an engineering assistant on a salary or wage basis.

Employee.

An employee as used herein shall mean any individual person employed by an engineer.

Contractor.

A contractor shall be any person contracting to perform the work called for by the engineer's plans and specifications.

ARTICLE III

Required Provisions

Employees shall have the right to organize and bargain collectively through representatives of their own choosing, and shall be free from the interference, restraint, or coercion of employers of labor, or their agents, in the designation of such representatives or in self-organization or in other concerted activities for the purpose of collective bargaining or other mutual aid or protection;

No employee and no one seeking employment shall be required as a condition of employment to join any company union or to refrain from joining, organizing, or assisting a labor organization of his own choosing;

Employers shall comply with the maximum hours of labor, minimum rates of pay, and other conditions of employment, approved or prescribed by the President;

Modification—This code and all the provisions thereof are expressly made subject to the right of the President, in accordance with the provision of Clause 10 (b) of the National Industrial Recovery Act, from time to time to cancel or modify any order, approval, license, rule or regulation, issued under Title I of said Act, and specifically to the right of the President to cancel or modify his approval of this code or any conditions imposed

by him upon his approval thereof.

a.—Minimum Wages.

No engineer or engineering assistant, employed on a salary or wage basis, shall be paid less than the minimum rates which are established regionally or locally by mutual agreements between truly representative groups of employers, and employees or as established or approved by the National Control Committee, as defined in Article VI, with the aid of its subordinate regional, state or local committees, and approved by the President, as provided by Section 7 (b) of the National Industrial Recovery Act. The minimum rates shall be at least those required by Article 3—"Minimum Wages" of the "Code of Fair Competition for the Construction Industry."

b.—Maximum Hours.

Maximum working hours for engineering assistants shall be in accordance with Article 4 — "Maximum Hours" of the "Code of Fair Competition for the Construction Industry."

c.—Age Limit.

Engineers shall not employ any one less than sixteen years of age, except that persons between fourteen and sixteen may be employed for not to exceed three hours per day between 7 A. M. and 7 P. M. on such work as will not interfere with hours of day school.

d.—Stabilization of Employment.

Engineers shall administer their functions so as to provide the maximum practicable continuity of employment to those in their employ. To this end the National Control Committee, through cooperation with other national professional engineering organizations, will furnish such data, reports of investigations and suggestions to the National Recovery Administration as may aid in bringing about a greater stabilization of the industry.

ARTICLE IV

Regulations Governing Relations Between Engineers and Their Clients or Employers

For the purpose of enforcing the provisions of this Code no engineer shall proceed with an engagement involving a fee of $1000 or more, without first entering into a written agreement with his client, and such agreement shall be kept and made available on demand for inspection by the National Control Committee or its delegated representatives.

Violation of this "Code of Fair Competition for the Professional Engineer Division of the Construction Industry" shall justify cancellation of relations by a client, dismissal by an employer or discipline by the National Control Committee and/or prosecution at law under the provisions of the National Industrial Recovery Act.

An engineer shall not:

a. Acquire, own, or otherwise benefit by the purchase, sale, or ownership in any real estate or business interest which may be affected by any work for which he shares responsibility, except with the full knowledge and consent of his client or employer.

b. Own stock in, or have other interest in, or in any way benefit from the business of a contractor employed on any work for which the engineer shares responsibility, except with the full knowledge and consent of his employer.

c. Accept any pay or commission, except as clearly stipulated in his contract or terms of employment, for the use of any materials, patented device, appliance, or method employed on the work.

d. Accept any fee or gratuity for engineering or other services rendered to any contractor or sub-contractor engaged on the work for which the engineer is engaged as the client's or employer's representative, or accept compensation, financial or otherwise, for services in connection with such project, from any person other than his client or employer. Nothing herein shall be construed to operate against the prevailing and good practice by contractors and sub-contractors of engaging engineers, other than the engineer of record for the work, to render engineering services to them in connection with their engagement as contractors or sub-contractors.

e. Specify, direct, invite, or accept engineering designs, studies or sketches from a contractor, sub-contractor, or supplier of materials, interested in the work or in bidding on any element of the work, where such are services herein defined, or defined in his agreement with his client or employer, as being the responsibility and duty of the engineer. This does not debar the customary shop and working drawings, made by contractors for the work to be executed by them, nor the use of technical trade information issued by producers for the information of engineers.

f. Give any rebate, discount, bonus, fee, or commission in order to reduce his fee, or in order to influence or procure employment on a salary or wage basis.

ARTICLE V

Unfair Practices

To maintain fair minimum salaries and wages for engineers and engineering assistants the National Control Committee with the aid of its subordinate regional, state or local committees, shall, within four months after the effective date of this Code, recommend for the approval of the President, schedules of fair minimum rates for all types of engineering services functional to the Construction Industry. In arriving at these schedules the National Control Committee shall endeavor to approximate rates generally equivalent to the average minimum rates which obtained in each region at the beginning of the year 1929.

To assure fair competition and prevent rendering of services by an engineer in private practice below cost of production, plus overhead, insurance, and incidental expenses, and to insure fair bases for the determination of cost-plus-fee terms of employment, the National Control Committee shall develop, with the cooperation of its subordinate regional, state and local sub-committees, standards of cost accounting with uniform methods of determining overhead, inclusive of principal's time and other chargeable items, subject to the approval of the Administrator.

To maintain fair minimum rates of charge for the various branches of engineering practice functional to the construction industry and to avoid price-cutting among engineers in private practice, but without any attempt at price-fixing, the National Control Committee with the aid of its subordinate regional, state, or local committees shall recommend for the approval of the President, schedules of fair minimum charges, where practicable. The recognition of such minimum schedules shall in no way operate against any engineer whose training, experience, reputation, or specialized practice, justifies a higher schedule of charges.

In the operation of this Code, before the establishment of engineering fees as above described, no engineer shall charge for his services, an amount, based upon the total cost of the work on which his services are rendered, less than that specified in the "Manual of Engineering Practice; No. 6. Charges for Engineering Services" adopted by the American Society of Civil Engineers, September, 1930, which is appended hereto.

If the character of the work requires architectural or other specialized services not included in the functions of an engineer, as hereinbefore defined, it is the engineer's duty to recommend specialists for employment by or on behalf of the owner and to coordinate their work.

When any person undertakes to provide engineering design or engineering services he shall be deemed an engineer in the meaning and application of, and functioning under this code, and as such shall make a separate and distinct charge for such designs or services as a separate account, said charge to be not less than the usual or prescribed professional charge made by engineers for such engineering designs or other engineering services.

In order to eliminate unethical and unfair competitive practices that violate sound public policy and proper professional procedure:

a. An engineer shall not enter into fee, salary, or wage competitive bidding with other engineers for a professional engagement.

b. An engineer shall not offer or provide free or contingent preliminary engineering services or free preliminary cost estimates, in competition with any other engineer whose services have been retained for the work as evidenced by a signed agreement.

c. An engineer employed in a salaried position on full time basis shall not solicit or accept employment outside of his salaried duties in competition with other engineers, nor authorize the use of his name for the solicitation of such work. He may serve in a consulting or advisory capacity with the consent of his employer.

d. No person shall perform or undertake to furnish or be responsible for engineering services unless he is qualified by education, experience and organization and as herein defined.

The engineer shall not be a party to the unfair practice of trading one contractor's bid against another's in an attempt to reduce the amount of a bid, nor shall he induce secondary bidding, nor in any other manner engage in or sanction the unfair practice known as "bid peddling."

The engineer shall observe the rules

of fairness in making known all requirements for the work for which he is responsible and shall furnish adequate information to all bidders alike. The engineer shall not submit his design drawings and specifications for contractor's bid until he has developed adequate preliminary information and essential pertinent data. He shall permit the contractor to satisfy himself as to the adequacy of the engineering information given and the practicability of the type and method of installation shown on the engineer's design and covered in his specifications. The engineer shall definitely establish in his design and specifications, the amounts of tolerance in positions, levels, dimensions, or weights which will be permissible, and shall include definite provisions for remedial measures, if such tolerances are exceeded.

The engineer, where so engaged, shall provide adequate and sufficient field supervision and inspection of the work and shall at all times be ready to accept or reject any part of the work as the installation proceeds.

Arbitration according to recognized practice or established federal or state laws shall be accepted as the approved method for adjudication of disputes, after decision by the engineer, and precedent to action at law.

ARTICLE VI
ADMINISTRATION

Admendments.

Amendments or revisions to this Code may be proposed by any truly representative professional engineering organization providing for membership as hereinbefore described, acting through the National Control Committee hereinafter defined.

National Control Committee.

To effectuate the purposes of this Code and provide for administrative control within the engineering profession in so far as it is a function of the construction industry, a National Control Committee shall be established composed of one member appointed by each of the national professional engineering organizations providing constitutional requirements for membership as hereinbefore defined in Article II, and which are indicated in the first paragraph of the Preamble of this Code as having subscribed to this Code on or before the day next but one prior to the date set by the National Recovery Administration for its public hearing on this Code, and of members of the American Society of Civil Engineers appointed by the President of the Society in number equal to three more than the total number of members appointed by the other national professional engineering organizations. Members of the National Control Committee shall serve without salary in the administration of this Code.

Subject to the approval of the Administrator this control committee shall have authority to make all needful rules and regulations for the administration and enforcement of the provisions of this Code. This control committee shall have authority to establish such sub-committees and such subordinate local, state and regional committees and to prescribe such duties, rules and regulations as are deemed necessary to carry out the purposes of this Code and of the National Industrial Recovery Act.

In the establishment of each such state committee (or where there is no state committee, in each regional committee), there shall be one representative, for each state, from the recognized existing or hereafter created state professional society, in which membership is contingent upon legal admission to the practice of engineering within that state. Such representative shall be designated by such recognized state Society.

The National Control Committee shall coordinate its acts with the administrative agency established under the Code of Fair Competition for the Construction Industry.

Administration Expense.

Each engineer subject to the jurisdiction of this Code and accepting the benefits of the activities of the National Control Committee hereunder shall pay to the same his equitable share of the amounts necessary to pay the cost of assembly, analysis and publication of reports and data, and of the maintenance of the said National Control Committee's committees and activities.

Effective Date.

This Code shall be effective ten days after approval by the President of the United States and shall be applicable only to professional engineering services functional to the Construction Industry undertaken after such date.

Saving Provision.

If any court of competent jurisdiction shall finally determine that any Article or section of any Article in this Code, shall be invalid, all other Articles and sections of this Code shall nevertheless remain and continue in full force and effect in the same manner as though they had been separately presented for approval and approved by the President.

* * * * *

At a meeting of the Code Committee of the New York State Society of Professional Engineers, held in New York on September 20th, the following revisions of the Sept. 18th draft of the Code, sponsored by the American Society of Civil Engineers, were set forth as conditions sine qua non to the approval of the said Code by the State Society. An amplification to assure covering the practice of surveying, as a branch of engineering, where the same is pertinent to the Construction Industry, is being formulated by the Metropolitan Chapters.

President Chapman has, in response to a request for approval from the American Society of Civil Engineers, advised that the State Society subscribes in principle to the Code as revised, but takes exception to certain features and offers as substitutes therefor the recommendations set forth.

Comments and recommendations relative to the provisions of the September 18th draft of Code of fair competition for the Engineering Division of the Construction Industry.

These are divided into two classes, the first preceded by the letter "A" being comments and suggestions for consideration and the second preceded by the letter "R," definite recommendations for proposed modifications or changes, together with the reasons therefor.

(Page 1) ("A") PREAMBLE

It is suggested that the first four paragraphs be deleted and that there be substituted therefor the following:

> "To effectuate the policies of Title 1 of the National Industrial Recovery Act during the period of emergency the following Code of Fair Competition covering relations between professional engineers, clients or employers, employees and others in respect to all construction work shall be standard."

And omit the letter "C" and "D" preceding the fifth and sixth paragraphs.

The above suggestion is made in view of several comments which have come to hand criticising the fact that any particular society or organization is mentioned in the Preamble as submitting a code which does not appear to be the general practice in the code drafting and consideration under the National Industrial Recovery Act.

("A") ARTICLE I

GENERAL CODE

It is suggested that after the last word of the first paragraph there be inserted:

> "Except as to those portions relating to compensation and/or matters related solely to the engineering profession."

The paragraph as written appears to be a rather broad acceptance of the contents of an unknown document and makes the engineers code null and void where contrary to the general construction industry code.

The engineering profession is deserving of some consideration and differentiation from all general classes of employees, otherwise there would be no necessity for an engineers code. It is with this thought in mind that the above suggestion is made.

(Page 2) ("R") ARTICLE II

DEFINITIONS AND FUNCTIONS

Professional Engineer (3rd and 4th Paragraphs).

The last three lines of the third paragraph and the fifth paragraph quoted from Article II of the American Society of Civil Engineers constitution appear inconsistent. This should be changed so as to embrace a positive definition rather than an inferential one.

The quoted portion from the constitution does not define what constitutes "active practice and responsible charge." It describes how and the extent to which certain specific services or applications of time may be construed as falling within the realm of active practice and responsible charge, such as engineering teaching, graduation from technical schools, graduation from non-technical schools and credit for non-graduate technical study. It is silent, however, on such important elements as are nominated and described in the data sheets transmitted to applicant member references.

5th Paragraph

In the second line insert after the words "shall include" the following:

> "the consolidation, investigation, evaluation, planning, designing, or responsible supervision of construction or operation in connection with any public or private utilities, structures, buildings, machines, equipment, processes, works or projects and/or" (follow with text of code through the

word "thereof" in the 18th line and insert after the word "thereof" the following:

"when such professional services require the application of engineering principles and data."

The above revision of this paragraph embodies the substance of the definition of the professional engineer as embodied in the New York State law governing the licensing and practice of professional engineering. It is felt to be more all-inclusive than that in the code wherein many specific classes of work are mentioned. With the addition as above suggested, the possibility of evasion or attempted subterfuge by claiming services did not fall within the realm of the profession would be avoided.

(Page 3) *Employee* (1st paragraph).

This definition would seem to lend itself to improvement. As it now stands, it is indefinite as to whether it means simply clerks, stenographers, laborers or individuals other than engineering assistants or professional engineers, as it would seem to include by its phraseology any person regardless of their classification.

("R") ARTICLE III

REQUIRED PROVISIONS

Page 4, *paragraph* 4.

In the third line substitute the word "section" for the word "clause" in order to be in accord with the phraseology of the National Industrial Recovery Act.

Minimum Wages (paragraph 5).

Omit the last sentence and substitute therefor:

"In the interim and until such minimum rates shall have been so established and approved, the minimum salary or wage for an engineer shall be $100.00 per week; for an engineering assistant rendering the lowest grade of sub-professional service $30.00 per week; for other employees at least those required by Article III "Minimum Wages" of the "Code of Fair Competition for the Construction Industry."

Stabilization of Employment (paragraph 8).

In the third line omit the words "other national" preceding the word "professional."

The National Control Committee is not a professional engineering organization per se but is a Code Authority, hence the word "other" should not be used.

The National Control Committee unquestionably would and should, in its activities, cooperate with any necessary professional engineering organization whether of a local, state or national character and hence the word "national" should not be used.

("R") ARTICLE IV

REGULATIONS GOVERNING RELATIONS BETWEEN ENGINEERS AND THEIR CLIENTS OR EMPLOYERS

Page 5, *paragraph* 4.

Insert after the word "employer" at the end of the paragraph the words "or client."

It seems reasonable to expect that the engineer's relation with a client should be equally as honorable as those with an employer.

("R") ARTICLE V

UNFAIR PRACTICES

Page 6, *paragraph* 5.

In the last line either the word "coordinate" or "direct" should be used to correspond with the similar provision in the architects' code.

("R") ARTICLE VI

ADMINISTRATION

National Control Committee (2nd paragraph, page 7).

Omit the subject matter after the words "Article II" in the sixth line and substitute therefor:

"which shall have subscribed to this code within ten days subsequent to its approval by the Administrator or President and in addition thereto not to exceed seven members to be appointed by the respective national professional engineering organizations, the number from each of such organizations to be based upon the relation of its corporate membership to the total membership of all said participating organizations and in addition thereto, member representation by engineering assistants not members of any such national organization, but in no case shall any of such organizations have a majority of the members on said committee."

The thoughts prompting the above recommendations are:

1: The present draft limits the membership of the committee to those national engineering organizations which have subscribed to the code not later than the day next but one prior to the public hearing thereon. There may be engineering organizations which have not and do not wish to subscribe to the code in the present form but which will subscribe after the public hearing and the adoption of a code either in its present form or as it may be modified or amended. They should not be penalized or precluded from membership on the National Committee for not subscribing to the code before the public hearing.

2: The advisability of vesting in any one organization a majority of control in matters of this kind is questionable. Therefore, it seems reasonable to have the committee member representation bear some relation to the membership of the respective national engineering organizations but provided that each shall have some representation and furthermore inasmuch as the code is to deal with the compensation of engineering assistants, an opportunity for that group to be represented seems advisable.

Page 8, *paragraph* 3.

Re-write to read:

"In the establishment of such regional and state committees, there shall be on each regional committee at least one representative from each state in the respective region, and not less than one third of the members of any state committee or of any state representation on a regional committee shall be from the recognized existing or hereafter created state professional society in which membership is contingent upon legal admission to the practice of engineering within that state, and such engineering assistant representatives as may be determined by the Administrator. The state society representatives shall be designated by such recognized state society and the representatives of the engineering assistants shall be members of their own choosing."

Administration Expense (5th paragraph, page 8).

The question has been raised as to how the equitable shares are to be borne by each engineer in the construction industry all of whom are subject to the code jurisdiction and how such shares will be collected and by whom collected and determined. It has been stated that it seems as though the federal government should defray some of the cost of the administration of the code. However, this is the general phraseology in practically all of the codes heretofore considered.

With this provision in the code, it would seem highly desirable to have representation by the assistant engineers who might raise the question of the levying of funds for the expense without having adequate representation. This point, however, is not stressed but inasmuch as it has been raised, is brought to attention at this time.

* * *

Public Works Possibilities

(Continued from Page 5)

stop capital outlay. Paving was discontinued, and then followed water supply, sewers, schools, hospitals and various other things which are vital parts of our lives, our social growth and, in fact, our civilization.

Next, came the need for discontinuing maintenance and repair of existing public improvements.

To distressed American municipalities, counties and states, came the breadline of the unemployed. People, who had used up their resources, whose credit was gone, whose friends had been compelled to cease further help, became part of a great army of unemployed. These people, unfortunate, in dire want and facing starvation, had to be helped. Private charities broke down. Not alone was the task too colossal for them, but their sources of contributions dried up, as the very people who had been contributing to them in turn suffered blow after blow upon their own financial resources.

Four years ago no one could have been wise enough to have foreseen the outgrowth of this crisis. Municipalities, counties and states, faced with budget problems, borrowing troubles and delinquent tax payments, had to find money for unemployment relief.

The status of the great City of New York is perhaps typical of the whole country, although, naturally, as the largest and richest city, the problem is of far greater magnitude than in other cases. In this city there are, as public charges, over 200,000 heads of families representing over a million people who, without public help, would face starvation, exposure and distress within 24 hours. The money for this relief comes from the Federal Government, from the State and from the city itself. The city has been spending at the rate of 40 million dollars a year for this work and it is only partially doing the job in an unsatisfactory manner.

Mention of this is made because of

the economies forced upon our communities by dwindling tax returns. The monies acquired by such measures as discharging employees, cutting pay and discontinuing the construction and even the maintenance of public works, were voraciously consumed by the insistent demands of the unemployed.

Had it not been for the depression the City of New York would, in the last three or four years, have been prosecuting its plains for extended water supply, completion of transportation systems and various other important necessary public improvements. These amounted to nearly 1 billion dollars; and, perhaps, 500 million dollars of this billion would have been spent in these last four years. Many other cities, counties, and states are in a similar position.

New York, having discontinued all propects of improvement, and in fact, neglected even proper maintenance of what it had in the way of public improvements, has asked the Government for help. It has requested 168 million dollars, exclusive of the Tri-Borough Bridge project for which a loan of $44,000,000 has just been granted. This money, if secured, will be used to start projects for which plans and specifications have been completed and which can be begun within 30 days of the receipt of the money. They include many things in all boroughs and departments of the city, such as sanitation, paving, school work, hospital work, transportation, etc. It is estimated that on the basis of 30 hours a week this will provide employment directly for 40,000 people and directly and indirectly for perhaps 300,000 wage earners.

Last May, before the passage of the N. R. A., the writer urged upon the Mayor of the City of New York, and with his consent, on the authorities at Washington, that this program, when taken up, should be—as a measure of public duty and city economy—linked up with the unemployment relief, by requiring contractors obtaining work on the public works program to select at least some of their men from the unemployed of the city. Persons required for public works could be, in part, drawn from the city's unemployment organization, and this course kept up until practically all would face the test of "Will they and can they work again?"

Such a procedure would not alone again stimulate business, but give back self-respect and self-reliance to those now living on the city's charity, and would, at the same time, relieve the drain on the city of 40 million a year for unemployment relief.

* * *

Employees' Code Submitted

(Continued from Page 6)

agreement of the representatives of the labor and trade associations there may be a neutral party to the committee. The committee shall have the following duties:

a. To recommend changes or provisions of this code as experience with its operation may show to be desirable.

b. To consider complaints as to violations or infractions of the code and to recommend proper remedies therefor.

c. To regulate every six (6) months the minimum wage rates as provided in this code in accord with the fluctuations in the cost of living as compared to the cost of living on August 1, 1933.

d. To adjust the various grades of technicians in any plant in accordance with provisions in Section 3.

e. The recommendations of this committee, when approved by the President, shall be considered to be part of this code and have the same effect and force as the provisions above stipulated.

* * *

City Government Reorganization

(Continued from Page 7)

policy in so far as it is applicable to the Boroughs which compose the City. That the task of conducting a government expending close to $800,000,000 annually is, under the present system, too great a responsibility for some and too little for others and that such system is no longer representative are the contentions of the writer who submits for what it is worth a plan of governmental reorganization for the entire City of New York. To attempt a complete explanation and description of such a comprehensive subject is beyond the scope of a dozen addresses and so one must ask indulgence if what follows is not entirely clear.

In the discussion the Borough of The Bronx will be referred to merely as representative of all Boroughs.

The City of New York consists of five (5) separate boroughs. Contained also within the limts of the City are five (5) distinct counties the boundaries of which are coincident with those of the boroughs. This is a situation which invites and lends itself toward an elimination of dual or overlapping agencies.

The question of overlapping is today a serious one in the affairs of City administration and while borough government is a municipal agency and county government a state agency there is no reason why the principal of Home Rule cannot be extended to comprehend both borough and county where they are one geographically. As a matter of fact the various boroughs or counties within the City are today of such importance as to warrant direct responsibility to the citizens thereof for their administration.

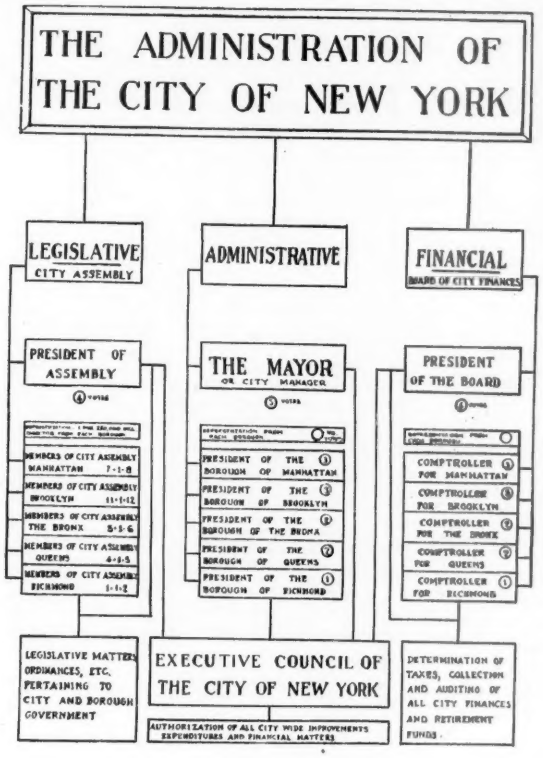
The scheme proposed would create within each borough machinery for administering affairs which are primarily pertinent thereto, and for which either directly or indirectly, the borough alone pays. Such matters as affect the City at large would be administered by a city wide or sort of super government in which each borough would, in all instances, have a proportionate representation and voice.

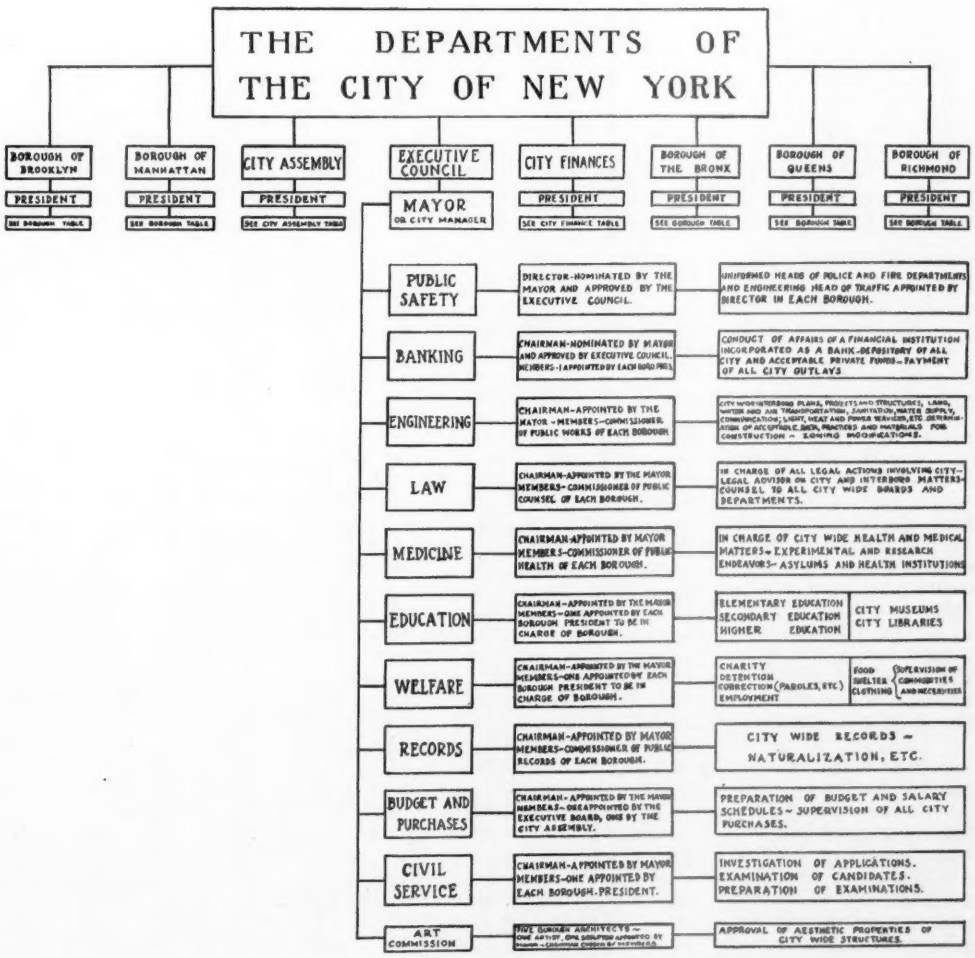
Within the borough there would be a governing body, known as the Exeutive Council of the Borough and elected by the people of the Borough, with a President, Director of Borough Assembly and Comptroller at its head. The Borough President, as Chief Executive, would appoint heads of Departments within the Borough. The Borough Assembly would inaugurate all assessable Borough Improvements, review assessments and approve franchises within the Borough. The Comptroller would collect and disburse Borough monies, determine tax rates and perform the usual financial duties of such an office. Many suggestions have from time to time been made by citizens and even groups but constructive as they may be in intent, invariably they reveal that the authors are not well versed in the present form and operation of city government as a whole. The speaker respectfully suggests that all else being equal, a person who has spent many years in the public service is better informed on its workings and better equipped to revise the same than one who has not.

The administrative agencies of the Borough would be four, viz., Public Works, Public Counsel, Public Health and Public Records. All public works conceived and paid for entirely out of borough funds would be and should be entirely the province of the Department of Public Works. All matters pertaining to streets, sewers, (except outlets) parks, buildings and assessments would be controlled by one agency—the Department of Public Works. All legal matters now covered by the offices of District Attorney, counsel to the various county and borough offices and to some extent the offices of the Corporation Counsel, would be covered and cared for by the Department of Public Counsel. Hospitals, ambulance service, administration of food and drugs, nursing service, hygiene, medical diagnosis, autopsy and similar matters would come within the scope of the Department of Public Health. The present offices of County Clerk, Register, Commissioner of Records and all other similar custodians of property, personal or public records and documents, would be replaced by the Department of Public Records. The details of other borough sub-divisions are shown on the charts. Such agencies as are interborough will be cared for by the City government with proper borough representation in each instance.

The city wide government would consist of administrative, legislative and financial elected officials, who would comprise the Executive Council of the City of New York similar in form to the present Board of Estimate and Apportionment. The administrative phase would comprehend matters of a city wide nature such as Public Safety (including both police and fire departments under one civilian head and eliminating the Sheriff in each County), Banking (see chart), Engineering, Law, Medicine, Education, Welfare, Records, Budget and Purchases, Civil Service and Art Commission. With the exception of the Director of Public Safety and the Chairman of the Banking Board, who would be nominated by the Mayor and approved by the City Assembly (after the fashion of high officials in national government) and the Civil Service, the various city wide departments would consist of commissions composed of the corresponding commissioners from each borough, together with a Chairman appointed by the

(Continued on Page 18)


THE ADMINISTRATION OF THE CITY OF NEW YORK
LEGISLATIVE
CITY ASSEMBLY
ADMINISTRATIVE
FINANCIAL
BOARD OF CITY FINANCES
PRESIDENT OF ASSEMBLY
4 votes
MEMBERS OF CITY ASSEMBLY MANHATTAN 7-1-8
MEMBERS OF CITY ASSEMBLY BROOKLYN 11-1-12
MEMBERS OF CITY ASSEMBLY THE BRONX 5-1-6
MEMBERS OF CITY ASSEMBLY QUEENS 4-1-5
MEMBERS OF CITY ASSEMBLY RICHMOND 1-1-2
THE MAYOR
OR CITY MANAGER
5 votes
PRESIDENT OF THE BOROUGH OF MANHATTAN 3
PRESIDENT OF THE BOROUGH OF BROOKLYN 3
PRESIDENT OF THE BOROUGH OF THE BRONX 2
PRESIDENT OF THE BOROUGH OF QUEENS 2
PRESIDENT OF THE BOROUGH OF RICHMOND 1
PRESIDENT OF THE BOARD
4 votes
COMPTROLLER FOR MANHATTAN 4
COMPTROLLER FOR BROOKLYN 4
COMPTROLLER FOR THE BRONX 2
COMPTROLLER FOR QUEENS 2
COMPTROLLER FOR RICHMOND 1
LEGISLATIVE MATTERS ORDINANCES, ETC. PERTAINING TO CITY AND BOROUGH GOVERNMENT
EXECUTIVE COUNCIL OF THE CITY OF NEW YORK
AUTHORIZATION OF ALL CITY WIDE IMPROVEMENTS EXPENDITURES AND FINANCIAL MATTERS
DETERMINATION OF TAXES, COLLECTION AND AUDITING OF ALL CITY FINANCES AND RETIREMENT FUNDS.


THE DEPARTMENTS OF THE CITY OF NEW YORK
BOROUGH OF BROOKLYN
PRESIDENT
SEE BOROUGH TABLE
BOROUGH OF MANHATTAN
PRESIDENT
SEE BOROUGH TABLE
CITY ASSEMBLY
PRESIDENT
SEE CITY ASSEMBLY TABLE
EXECUTIVE COUNCIL
MAYOR
OR CITY MANAGER
CITY FINANCES
PRESIDENT
SEE CITY FINANCE TABLE
BOROUGH OF THE BRONX
PRESIDENT
SEE BOROUGH TABLE
BOROUGH OF QUEENS
PRESIDENT
SEE BOROUGH TABLE
BOROUGH OF RICHMOND
PRESIDENT
SEE BOROUGH TABLE
PUBLIC SAFETY
DIRECTOR-NOMINATED BY THE MAYOR AND APPROVED BY THE EXECUTIVE COUNCIL.
UNIFORMED HEADS OF POLICE AND FIRE DEPARTMENTS AND ENGINEERING HEAD OF TRAFFIC APPOINTED BY DIRECTOR IN EACH BOROUGH.
BANKING
CHAIRMAN-NOMINATED BY MAYOR AND APPROVED BY EXECUTIVE COUNCIL. MEMBERS-APPOINTED BY EACH BOROUGH.
CONDUCT OF AFFAIRS OF A FINANCIAL INSTITUTION INCORPORATED AS A BANK-DEPOSITORY OF ALL CITY AND ACCEPTABLE PRIVATE FUNDS-PAYMENT OF ALL CITY OUTLAYS
ENGINEERING
CHAIRMAN-APPOINTED BY THE MAYOR-MEMBERS-COMMISSIONER OF PUBLIC WORKS OF EACH BOROUGH.
CITY WIDE INTERBORO PLANS, PROJECTS AND STRUCTURES, LAND, WATER AND AIR TRANSPORTATION, SANITATION, WATER SUPPLY, COMMUNICATION, LIGHT, HEAT AND POWER SERVICES, ETC. DESIGNATION OF ACCEPTABLE DATA, PRACTICE AND MATERIALS FOR CONSTRUCTION - ZONING MODIFICATIONS.
LAW
CHAIRMAN-APPOINTED BY THE MAYOR MEMBERS-COMMISSIONER OF PUBLIC COUNSEL OF EACH BOROUGH.
IN CHARGE OF ALL LEGAL ACTIONS INVOLVING CITY-LEGAL ADVISOR ON CITY AND INTERBORO MATTERS-COUNSEL TO ALL CITY WIDE BOARDS AND DEPARTMENTS.
MEDICINE
CHAIRMAN-APPOINTED BY MAYOR MEMBERS-COMMISSIONER OF PUBLIC HEALTH OF EACH BOROUGH.
IN CHARGE OF CITY WIDE HEALTH AND MEDICAL MATTERS-EXPERIMENTAL AND RESEARCH ENDEAVORS-ASYLUMS AND HEALTH INSTITUTIONS
EDUCATION
CHAIRMAN-APPOINTED BY THE MAYOR MEMBERS-ONE APPOINTED BY EACH BOROUGH PRESIDENT TO BE IN CHARGE OF BOROUGH.
ELEMENTARY EDUCATION
SECONDARY EDUCATION
HIGHER EDUCATION
CITY MUSEUMS
CITY LIBRARIES
WELFARE
CHAIRMAN-APPOINTED BY THE MAYOR MEMBERS-ONE APPOINTED BY EACH BOROUGH PRESIDENT TO BE IN CHARGE OF BOROUGH.
CHARITY
DETENTION
CORRECTION (PAROLES, ETC.)
EMPLOYMENT
FOOD
SHELTER
CLOTHING
(SUPERVISION OF COMMODITIES AND NECESSITIES)
RECORDS
CHAIRMAN-APPOINTED BY MAYOR MEMBERS-COMMISSIONER OF PUBLIC RECORDS OF EACH BOROUGH.
CITY WIDE RECORDS - NATURALIZATION, ETC.
BUDGET AND PURCHASES
CHAIRMAN-APPOINTED BY THE MAYOR MEMBERS-ONE APPOINTED BY THE EXECUTIVE BOARD, ONE BY THE CITY ASSEMBLY.
PREPARATION OF BUDGET AND SALARY SCHEDULES - SUPERVISION OF ALL CITY PURCHASES.
CIVIL SERVICE
CHAIRMAN-APPOINTED BY MAYOR MEMBERS-ONE APPOINTED BY EACH BOROUGH-PRESIDENT.
INVESTIGATION OF APPLICATIONS. EXAMINATION OF CANDIDATES. PREPARATION OF EXAMINATIONS.
ART COMMISSION
FIVE BOROUGH ARCHITECTS - ONE ARTIST, ONE SCULPTOR APPOINTED BY MAYOR - CHAIRMAN CHOSEN BY MEMBERS
APPROVAL OF AESTHETIC PROPERTIES OF CITY WIDE STRUCTURES.
NOTE: CHAIRMAN AND MEMBERS OF DEPARTMENTS OF ENGINEERING, LAW AND MEDICINE SHALL BE LICENSED PRACTITIONERS WITH NOT LESS THAN 10 YEARS ACTIVE PRACTICE.

ARTHUR V. SHERIDAN.

City Government Reorganization

(Continued from Page 16)

Mayor. In this way each borough would have a proportionate representation and vote in each city wide Commission, whereas to-day the Bronx has not a single representative on such important Commissions as the Boards of Water Supply, Transportation, Sanitation, Standards and Appeals and the Civil Service.

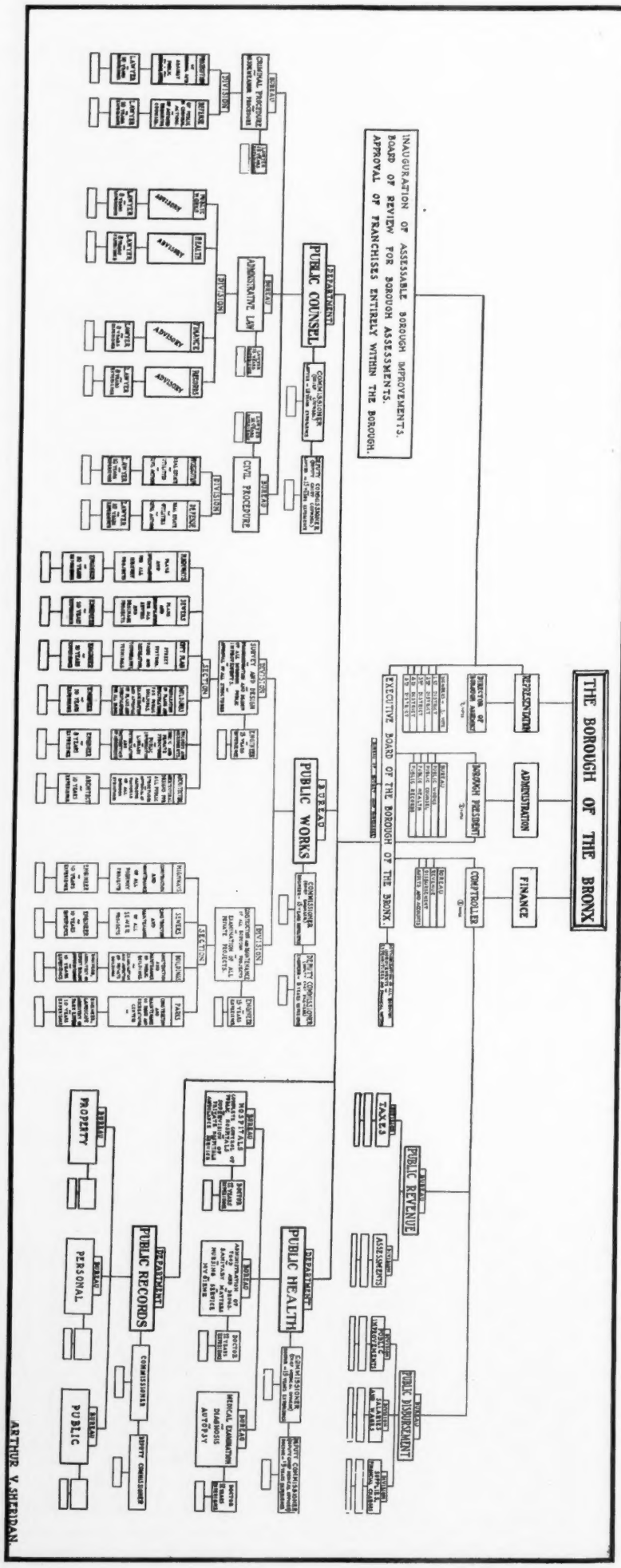
Instead of the present Department of Finance there would be a Board of City Finances composed of the Comptrollers of each borough with the elected City President of the Board as Chairman. The Board of City Finances would pro-rate the cost of city wide administration amongst the several boroughs. The Borough tax would be fixed in somewhat the same manner as is now done in a more involved fashion.

All legislative matters, local laws and ordinances would be the same for the entire City and would become the province of the City Assembly composed of the members of the Borough Assemblies with the elected President of the City Assembly at the head thereof.

On all Boards, Departments, Commissions and other city wide agencies a previously determined voting power of the Borough would be maintained. From such a skeleton can be developed, as is suggested in the chart, a complete form of city government that would alter the present unwarranted method of permitting the Borough of Brooklyn, for example, to have twice as much voting power on matters pertinent only to and paid entirely for by The Bronx as the Borough of The Bronx itself and would eliminate the absurd procedure which makes it so necessary for a Building Department, Tenement House Department, Fire Department, and at times Dock Department, Health Department and other agencies to pass upon matters that in all common sense belong to and can more properly and efficiently be taken care of by one Building Bureau within the Borough and would in addition, make directly responsible to the people of the Borough the officials whom they elect to administer the affairs of what are termed boroughs but which are in point of population and wealth greater than most of the important cities of the nation. (A recent legislative act, consolidating many of the functions of the Tenement House Department, Fire Department and other agencies having supervision over phases of building construction, embodies, to some extent, one of the above proposals).

The proposal creates much that is new and eliminates much that is existent. On the whole it is believed that an analysis will show a material saving in economy and efficiency and in addition thereto it promises to place the citizen in closer contact with matters of government; a most desired and healthy political condition under all circumstances.

One of the objectives in mind has been an elasticity that will permit of modification as well as a partial or installment adoption without altering



the basic idea of adequate borough representation under all conditions.

A casual review of the proposal may lead some to the conclusion that it will prevent proper co-ordination in the development of the city. To such I would reply that all agencies that now exist are provided for and amplified and that the difference is principally that every borough would be represented on every agency, instead of some on one and some on another in the haphazard manner which now deprives communities of over a million or even two million persons of a direct voice in the activities of city wide commissions and departments and which practically compels a borough to accept the will of those whose interests may be elsewhere.

No attempt has been made to include the judicial agencies in the proposal for the reason that such part of the government would and should receive consideration from those more familiar with prevailing judicial systems than is the speaker and perhaps such agencies are probably best administered when divorced from other phases of government.

Many problems of legislation, finance and law would be involved before the proposal could be effected, but where there is a will there is a way and they are not insurmountable.

No one realizes better than the writer that the plan submitted is a most imperfect one but he believes that it will provide a better, more efficient and more representative government than the present form and it is as a constructive suggestion and not as a panacea that it is offered.

Note:—Comments are invited.

* * *

Technocracy

(Continued from Page 8)

months, the releasing of our equipment would provide a minimum per capita income equivalent to a buying power under the present system of from twelve hundred to fifteen hundred dollars per year. ($6,000 to $7,500 per family). This is a minimum per capita income larger than has ever existed in the history of the world. Almost immediately the necessity for charity and relief organizations would be ended.

The Research Department of the Continental Committee on Technocracy estimates that eventually the work requirement per individual will amount to not more than sixteen hours per week. During the early transitional period, while the existing industrial plant which today is largely obsolete, is being supplanted by a modern plant which will take full advantage of technical knowledge, forty hours a week may be required of all workers. As the hours of work decrease purchasing power will increase until a society is attained in which economic insecurity is unknown and every individual possesses all that he needs of essential goods.

The effort of the Administration to produce artificial scarcity by curtailing production is an acknowledgment of the basic principle of Technocracy. By so doing it admits that scarcity is essential to the functioning of the price system and furthermore that scarcity no longer exists.

To sum up:

(a) The problem of production is solved. Goods and services sufficient to satisfy every need and every reasonable want can be provided for the entire population by fully utilizing modern technology.

(b) The price system does not function satisfactorily under present conditions, that is to say, under conditions of potential plenty.

(c) A new economy must be established which will function even when commodities are in ample supply.

Certain Definite Characteristics of this new economy can be indicated.

II. Fundamental Characteristics of Technocracy

(1) *The machinery of production and distribution will be organized into an integrated whole and operated for the benefit of the entire population.*

When goods are scarce it is possible to allow any individual to produce any article under a competitive economic system. When however, goods are redundant it is necessary to direct and regulate production.

By this means the required quantity of goods can be produced by the most efficient methods and waste avoided. For example, certain regions are best fitted for the culture of wheat. When these regions are producing sufficient wheat to satisfy all needs, it is obvious that the less desirable areas should not be planted with a crop which no one will want, but instead should be given over to some other unessential but still desirable culture. When, for example, copper is over-produced, certain mines should be worked and others left in reserve. In respect to manufactured goods it is obvious that those factories which make the best use of our energy resources at the least expenditure of man-power should be operated and the obsolete plants discarded or brought up to date. Only by central direction can these objectives be accomplished and full advantage taken of the genius of our scientists and the achievements of our inventors.

(2) *The capacity of this Continental producing plant will be measured in some standard unit.*

Since the dollar, based on gold, or faith, is not a unit of measurement, it obviously will not do. It merely gives the relative supply of commodities in terms of another commodity or, when a nation is off the gold standard, in terms of each other. Consequently, prices vary continuously as supplies vary, even as the desires of the population vary; thus dollars are useless for purposes of measurement. Therefore, a new unit must be devised with which to measure the total productive capacity of the Continental producing plant and to serve as a basis for issuing an equal purchasing power and for pro rating all the various commodities.

This new unit is to be based on energy cost, since energy in modern plants is the essential factor in production. Labor cost, once the primitive handicraft stage is passed, bears no measurable relation to production. Man acts chiefly as attendant to, or supervisor of, the mechanism of energy conversion; his energy contribution is negligible in industrialized countries.

Though energy cost will be the basis on which total productive capacity is figured, other factors must be considered in pricing consumers' goods and services. For example, the supply of some commodities such as foodstuffs, is inexhaustible or recurrent, and the supply of others is definitely limited. In a rational economy, limited resources will be conserved, in so far as feasible, by price adjustments. In order, for example, to utilize an entire beef the less desirable sections had best be priced lower than the choice cuts even though the energy cost of the various sections of the animal may be nearly the same.

Energy cost is an adequate yard stick for measuring the total capacity of the population. This total capacity measurement is needed in order that a purchasing power of equal proportions may be issued. The objective is to balance production and consumption in order that goods and energy be neither squandered nor hoarded, and that the budget of the community shall automatically balance itself—a budget figured in terms of energy cost of goods produced.

(3) *In order to create a purchasing power sufficient to procure the commodities which the accelerated rate of industrial activity will produce, a new monetary system will be instituted. The units of this new system may be called dollars. They will be issued to the entire population. Their sum, that is to say the total purchasing power of the people, will procure all the goods and services available for consumption during a predetermined period called the balanced load period.*

To avoid the recreation of a debt burden, and the arrest of distribution which results from borrowing on the future for things used in the present, the new dollar will have the following characteristics:

(a) It will be issued against available goods and services.

(b) It will be non-transferable.

(c) It will be cancelled at the point of distribution for consumable goods and services as these are obtained.

(d) It will be issued for definite periods of time and at the end of each period it will be cancelled whether used or not.

(e) It will be issued under proper control to every individual.

Control is to be used in case an individual refuses to fulfill his obligations. In a Technocracy, the only form of taxation—if it can be so called—is the number of working hours required of the individual to operate adequately the industrial and social machinery. In return for these hours of service during certain productive years of his life, the individual receives not only security, liberty and leisure during his whole life, but a consuming power equal to that of the present so-called leisure class. Furthermore, in a Technocracy, every possible latitude will be allowed him regarding the kind of service he contributes and a change of vocation will be permitted if desired. Even so, an individual may conceivably refuse to do any work. In that case his Purchasing Certificates may be withdrawn until he changes his mind unless on the advice of proper medical

authority he is to be treated as a mental case.

III. Secondary Consideration

Beside the three characteristics given above which are indicated by the physical structure of our producing and distributing system, a number of secondary measures are advisable. It is necessary, owing to the complexity of our industrial system, that the transition from the old order to the new should be effected in an orderly and controlled manner, so that the functions vital to human existence may be protected throughout the transitional process.

(a) It may be advisable during the period of transition to maintain differential incomes in order not to upset existing industrial methods and institutions. Customary consuming habits will alter gradually rather than too radically. As the goal of Technocracy, plenty for all, is approached, the need for differential spending powers will disappear and money would entirely cease to be the symbol of success.

During the time of transition leaders of public opinion and educators should prepare the people for the replacement of the present greed motif by an older and more efficient one, the instinctive desire of all human beings for prestige, for the appreciation of their fellows. This is necessary because differential consuming power loses its force as an incentive to effort when everyone can have every material thing within reason that he wants.

(b) Since it is important to keep goods moving and factories producing during the transitional period, it is advisable to protect present owners of income-bearing property (the kept classes), from curtailment of their expenditures for consumption of goods and services.

This latter issue is not a moral but a technical one. Fourteen or more million unemployed will have to be absorbed immediately. There is no technical reason for, and many reasons against, adding to this membership instantaneously by shutting down the luxury trades and closing up the large houses and estates.

Technocracy provides a leveling up of incomes and not a paring down, therefore it is more practical to effect this process by leaving the "kept classes" where they are and bringing up the general standard of living to a comparable level.

(c) Though the spending power of the debt wealthy may be preserved, their control over production by ownership or other means will immediately be cancelled. This is essential. No means must be left them by which they could sabotage the working of the new order.

IV. The Establishment of Technocracy

The question has frequently arisen as to just how Technocracy could be introduced in the United States without doing violence to established constitutional procedure. The following sets forth briefly how this can be acacomplished under the constitutional powers vested in the President and the Congress.

The method is well established by legal precedent. In the National Industrial Recovery Act we note that "A National emergency productive of widespread unemployment and disorganization of industry, which * * * * affects the public welfare, and undermines the standards of living of the American people, is hereby declared to exist." This declaration made by Congress and approved by the President frees the legislative and executive branches of government from all constitutional restrictions in so far as may be necessary to meet the emergency and to prevent its recurrence. Thus Congress and the President have the power to meet the emergency by such action as will remove the cause of "widespread unemployment and disorganization of industry" and to thus secure the "public welfare." It is obviously their duty to do so.

The cause of the present emergency, with its "widespread unemployment and disorganization of industry," is the price system. This system is defined in Technocracy as "That economic system in which commodities are competitively produced and distributed for private profit." This system has endangered the "public welfare" and has "undermined the standards of living of the American people." Constituting as it does, a national emergency, the price system could and should be abolished under existing authority, by legal means.

"The process (a change of the system) will not require even an amendment to the Constitution; the thing can be done through the application of the police powers, the tax laws and the further extension of Chief Justice Marshall's doctrine of the incidental powers of Congress." (Louis Benedict in Public Utilities Fortnightly, January 8th, 1931).

Too often a so-called leader is one who sees the way the crowd is going and steps out in front. But the true leader steps out in the right direction and draws the crowd with him. The Administration today has the greatest opportunity in history to lead the nation out of this emergency and to immunize it to all future economic emergencies.

The Continental Committee on Technocracy proposes by education, organization, and effective social pressure to induce, if possible, the President and the Congress to take the effective measures which it advocates, and this action failing on the part of the Chief Executive and Congress, to assume leadership of the American people and obtain a backing of sufficient numbers of the people themselves to force the issue.

V. Emergency Measures

In order to avoid confusion during the critical period of transition, the Continental Committee on Technocracy recommends that the following measures be taken by the National Administration under the powers granted by Congress: These measures are designed to introduce the new system in an orderly manner:

A. The declaration of a general moratorium.

B. The assumption of control by the authorities of all properties affecting production or distribution of commodities, pending final adjustment under the new system.

C. A proclamation of continued service, requiring every individual or group to continue his or its task until confirmed, transferred or relieved.

D. The general registration of the entire population to be carried out in accordance with the Selective Service Regulations.

E. The authorization of requisitions by individuals or groups which will be honored for any and all necessary supplies, food, clothing, shelter and the service of public utilities, pending final adjustment under the new system.

These emergency decrees are necessary to quiet fear and prevent disorder. A state of public tranquility is required for the establishment of the new system. No man must be concerned about food, shelter or any of the necessities of life. Reason must be allowed to rule, unhampered by anxiety.

VI. Introduction of Technocracy

As soon as the registration is completed and the primary wants of the population satisfied, the Administration should proceed to establish the new economy by the following series of constructive steps:

1. A National Control Board shall be selected consisting of qualified individuals who are convinced of the practicability and necessity of Technocracy, whose personalities and records inspire confidence.

2. Sufficient foodstuffs shall be requisitioned and paid for under the power of Eminent Domain to ration the entire population for such periods as may from time to time be necessary.

3. All stores shall be requisitioned in every community.

4. A Food Administration shall be organized, which shall control and regulate the distribution of foodstuffs to all the population.

5. Sufficient dollars shall be issued by the Treasury Department to cover the cost of the above and of all subsequent requisitions.

6. Idle factories, the products of which can be consumed by the population, shall be operated by a personnel drawn as largely as possible from the unemployed, as rapidly as the necessary organizations can be established to carry such work forward.

7. Purchasing Certificates shall be devised in accordance with Section 3 of "Fundamental Characteristics" and issued to all the people in lieu of dollars as rapidly as practicable.

8. The distribution of food, clothing and all other necessary commodities, subject to quantity production, and therefore easily made available in sufficient quantities to satisfy the needs of the population, will then be taken over by similar central administrations, as rapidly as facilities admit. Purchasing power shall be progressively increased so that the population can procure such commodities.

9. Public utilities, the transportation system and other such essential services shall be requisitioned and operated by the existing personnel for the benefit of the community.

The issuance of billions of old dollars to cover the various requisitions, as well as the issuance of the Purchasing Certificates, will rapidly devaluate the old dollar and raise free prices. The only free prices after the Central Control has taken over the produc-

tion and distribution of commodities subject to quantity production, will be the prices of goods intrinsically scarce, such as oil paintings, first editions, antique furniture, works of handicraft, jewelry and other items. These will be left, like the old dollar, to their own devices.

As the measures above provided become effective the concept of property will change. Since the production and distribution of all essential and many non-essential commodities comes under public control to be operated for the use of society and not for the benefit of individual owners, the ownership of the resources of the nation and of its producing and distributing equipment will be vested in society.

Although the farmer will be required to grow the crops and stock for which his land is best fitted and will be assisted in cultivation, fertilization and husbandry, his place in society need not be fundamentally altered. He, too, will receive his purchasing power in Certificates which will be entirely independent of the success of his efforts. In other words, his living will be made equally secure with all others.

In general, such property as is actually used and possessed by the individual will remain private property. Property necessary for public services which will hereafter include the production and distribution of all commodities, essential and non-essential, which are now no longer by their nature scarce, will be requisitioned, paid for, and vested in society.

Obviously under this system no taxation of any kind will be needed.

VII. Conclusion

The considerations above set forth have been governed solely by the necessities of the situation. Moral, humane, esthetic and spiritual values can be realized only when a sound economic foundation has been laid. This document has to do only with the laying of such a foundation. First of all the works must be kept going, our people allowed to exist, and civilization to develop.

One thought irrelevant to the scientific approach may be permitted in conclusion. So long as scarcity existed, people were predatory from necessity. Individuals and nations as well as jungle folk have been subject to the competitive struggle called "the survival of the fittest." The economy of plenty will end all that.

The establishment of Technocracy will be the beginning of a new era. Not only will human relations be completely changed when the life of no individual depends upon the whim of another, but group associations also will be transformed.

Nationalism, today inevitably tainted by imperialism and other forms of Chauvinism, becomes a completely new thing. A nation adopting Technocracy would be a nation free from fear. No other nation could attack it. It would be too well organized. And a Technocracy would have nothing to obtain from another nation. Therefore, it could not be predatory.

America, young, energetic, the land of a new race, bred from the mingled strains of all the world, is the fit nation to take this forward step. Fate has indicated its election because only America is truly self-sufficient, not only in material resources but in technical skill. Once again her people are challenged by an opportunity to pioneer—this time a pioneering task which asks no conquest but the creation of a society greater, finer, and more serene than has ever before existed.

* * *

The Profession in Australia

(Continued from Page 9)

and Simplified Practice is well known to all members.

The various Committees of Council which function, or have functioned, are as follows: Executive Committee of the Council; Finance; Constitutional Questions; Qualifications for Membership; Papers and Publications; The Journal; Board of Examiners; Conditions of Contract; Library; Industrial Research; Road Construction; Code of Ethics; Professional Conduct; Scale of Fees; Registration of Engineers; Publicity; Engineering Drawing Practice; Engineering Standardization; and Electrical Wiring Rules; and the majority of these Committees is assisted by Councillors who correspond with them.

Registration of Engineers

The Council and Division Committees of the Institution have for years endeavored to secure legislation in the various States of the Commonwealth for registration, which, if conducted upon right lines should give a necessary protection to the public, and lead to the general recognition that our profession is at least on the same plane as Medicine and Law. Due to the influence of the Institution, the Queensland Government, 1929, passed a Professional Engineers' Registration Act, and as a member of the first Registration Board in Australia (i. e., the Queensland Board), I am of opinion that registration in Queensland is acting in the interests of the public and the profession. Much ground work has been done by the Melbourne Division of the Institution towards the passing of a suitable Registration Act, and definite promises have been given by leading politicians on both sides of the Victorian Parliament that the measure will receive attention when possible. In South Australia, it is understood that a movement is on foot to provide for the examination and registration of Local Authority Engineers. All these things are steps in the right direction, provided that the Registration Boards have standards which are at least equal to those of The Institution of Engineers, Australia. In Queensland, the standard is at least as high as that of the Institution for entrance before the candidates can be registered.

Royal Charter

We continue to look forward to the time when the Institution may be granted a Royal Charter. The grant of such a Charter must, naturally, be contingent upon the goodwill of the great chartered engineering institutions of the Empire, and this will be bound up with the qualifications of our own members and standard of our Journal and publications, upon which we shall very largely be judged. The advantages of a Royal Charter are that it is granted by Royal prerogative upon the advice of the Privy Council, and hence any privileges so obtained would apply throughout the British Dominions to the undoubted advancement of the status of the Institution and its individual members.

Engineering and Reduction of Unemployment

To what end has been all this work? It surely has been for the benefit and happiness of the Nation, due to the maintenance of a high standard in engineering and engineering ethics. Our engineering efforts have been mainly directed toward speeding up operations in manufacture; in transport and primary products generally, in health and public utility services and in raising the standard of human comfort and happiness for the majority, if not for all. That it has not been for all is a weakness in the organisation of our modern social system, and is a defect which must surely be remedied.

There is a tendency in these days of serious unemployment to blame the engineer for having invented and constructed machines which greatly increase output per man, thus throwing men out of employment for long periods. The fact that we have successfully invented, constructed and used such machines, however, ever spurs us on to discover new methods of primary production, to invent new manners of manufacture, new methods of transport, new modes of amusement, and higher standards of living, each of which is an absorption factor for our man power. In road building, I have never known the employment of machines to increase unemployment. The money saved on one job of road building or bridge building has always immediately become available for the creation of more work on another. All industry, however, is not so fortunately organized, largely because we often launch a labour-saving scheme without having first provided some other means of absorption of those who will be released from laborious and wasteful labour. Our Captains of Industry may be compelled to study this matter, for it means enlargement of their own activities, and the rendering safe of their own positions, as well as the employment of surplus labour.

The Council of the Institution has given considerable attention to the question of future development and absorption of unemployed, and passed a resolution at the Melbourne Conference, early in 1931, since published in The Journal under the heading of "Be Prepared." It endeavored, not very successfully, to have this message broadcast by the press throughout Australia; probably it was not worded in sufficiently picturesque language. Its message was to Governments and private enterprise to try and relieve the unemployment in succeeding years by the promulgation of healthy, well-considered industrial and social schemes for the early rehabilitation of the country. We clearly pointed out the manner in which schemes for reproductive work should at once be investigated, and how the engineering profession could be profitably engaged in such work, for there is undoubtedly a certain amount of capital which

even now would be prepared to engage upon schemes which could be shown to be reproductive. The engineer is always very directly connected with production; the selling of products is a matter to which he might devote more attention.

ENGINEERING EDUCATION AND TRAINING

If we, as engineers, are to achieve fully that which our training makes possible for us, we must acquire the habit of lucidly conveying to the minds of our fellow citizens what is in our own, so that we may acquire the use of capital and labour-fluxed to produce the molten metal which may be moulded and rolled under our direction into the vehicles of life.

The encouragement of our Juniors and Students to read, discuss, and criticise papers, is a necessary step towards this end, if we are to increase the influence of engineers in future. The laymen must be convinced of the economics of projects; of their social or material benefit before they will become interested.

The matter of the better training and education of the younger engineers in the study of engineering economics and ordinary business methods is one which has engaged the attention of your Council during the preceding year, the matter having been very strongly raised by the Newcastle Division of the Institution, which, as a manufacturing centre, is, of course, vitally interested. The inclusion of a course of engineering economics, and of commercial knowledge in the curriculum of training of our young engineers, even if it becomes necessary thereby to relegate to post-graduate courses some of our more strictly technical work, would, in my opinion, be well worth consideration in the future. Our engineering education should be such as to give the man who acquires it as wide a choice of service and employment as possible, and to do that we must imbue him with an economic sense. He should not be excluded from such positions as management of companies, which today he seldom acquires, by reason of the fact that people say, "Oh, he's an engineer, and not a business man," hardly realising that the whole of the energies of an engineer, in the design and erection of structures and machines require an intimate knowledge of business. If the origination and subsequent running of engineering enterprises were in the hands of engineers, if they were given the responsibility of building only reproductive or socially useful works, it surely would be more sensible than attempting to make them mere "hewers of woods and drawers of water" in ill-considered schemes.

ENGINEERING, AN ART AND SCIENCE

Primarily we are builders, and our foundations must be laid upon the facts of science and the empirical knowledge of the past. Our works are both static and dynamic, embellished on the one hand by artistic treatment, and on the other by the poetry of motion. Our Past President Corlette has castigated us for our aesthetic failure on the static side, as has also Professor Wilkinson in his Presidential Address to the Architectural and Engineering Session of the Australian and New Zealand Association for the Advancement of Science. Our dynamic work, however, is embellished by the beauty of motion, rivalled only by those worshippers of Terpsichore who demonstrate to us the poetry of human motion. The control of those motions substantiates the old claim that man the master of these machines producing the necessities of life is "but a little lower than the angels"; indeed the electrical engineer of today appears to be gaining control of everything except that "vital spark of heavenly flame," so beautifully spoken of by Pope. The civil engineer is surely in general an artist whose imagination can, and does, produce loveliness of form and structure, although occasionally we see horrible examples of work from an aesthetic point of view. Bridges, mountain roads, dams, etc., can surely be made things of beauty without violation of our sense of economics, and this is one of the things of which Colonel Corlette spoke, and which I feel he must again emphasize. Whatever branch of engineering we are engaged in, we are all searchers after truth, and so the structures built upon the known facts of science, upon the experiences of the past, and embellished with art will be our permanent monument, good or bad according to the truth embodied.

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MUSEUM OF SCIENCE AND INDUSTRY

(Continued from Page 10)

of livelihood and defense, become transformed into the powerful locomotive, the giant press, the swift plane.

It has been suggested that an ideal site for such a museum would be the block in the Chrystie-Forsyth area nearest the bridge exit. This would be a place convenient of access from Brooklyn and Long Island as well as Manhattan and the Bronx. But whatever site is eventually found, it should be centrally located and preferably on the east side, which has now no public museum. With the beginning of what seems to be a new chapter in our industrial history, now is an especially good time to plan. Here is an outstanding opportunity for one person or for many persons to build and endow an institution that will have a permanent place in the life of the city along with the other great museums—of the fine arts and of natural history. Once the building were provided from private sources, with workingmen's aid in free time in its erection and adornment, the industries would themselves fill it.

* * *

PUBLIC WORKS TO RESTORE PROSPERITY

Statement by Dr. D. B. Steinman, Chairman for the Metropolitan New York District of the National Committee for Trade Recovery

With so much popular attention and interest focussed on the N. R. A., the public has lost sight of the more urgent and vitally more important program of starting large-scale public works construction for which the Federal government has appropriated over three billion dollars under Title II of the same National Industrial Recovery Act. The most urgent problem before the American people now is to expedite capital expenditure to restore employment. Private financing has been hit on the head and has not yet recovered; government financing must take the lead and set the example until confidence is restored.

Leading economists and leading engineers are now agreed on the para mount importance and urgency of the capital expenditures program to end the depression. J. M. Keynes, the noted British economist, says: "If I were in the President's shoes I should direct all my energizing powers to this proposal."

Public interest in this program needs to be dramatically mobilized. A terrific drive is required to produce quick results. The Federal government offers grants and loans to states, counties, cities, towns and villages to pay for the immediate construction of public improvements, and the communities should cooperate by promptly qualifying and applying for these loans and letting the contracts. Competent engineers and architects should be engaged to rush the preparation of the plans and the applications. Enabling legislation should be passed in all state legislatures, and any impeding statutes promptly corrected. The Federal Emergency Administration of Public Works, under Secretary of the Interior Ickes, should handle the entire situation as a critical emergency, relaxing restrictions and cutting official red tape. The public should cooperate by supporting the program, demanding the immediate expenditure of the present funds and the appropriation by Congress of billions more, if necessary, for the Public Works administration.

Employment and wages cannot pour from the spigot unless capital is poured into the reservoir. The only way to end the depression is to reemploy men in producing capital assets. The restoration of prosperity will amply repay the investment.

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NEW YORK LEGISLATION 1934

(Continued from Page 10)

surveyors from making and plotting surveys other than land surveys.

REPEAL OF CONFLICTING LEGISLATION

All laws or parts of laws in conflict with the provisions of this act shall be, and the same are hereby, repealed.

INVALID SECTIONS

If any Section or Sections of this act shall be declared unconstitutional or invalid, this shall not invalidate any other Sections of this Act.

* * *

THE POLYTECHNIC INSTITUTE OF BROOKLYN

Graduate Courses in Engineering, Chemistry, Physics, Mathematics, Economics

The following announcement from The Polytechnic Institute of Brooklyn is printed for the information of interested Engineers.

1933-34 SESSIONS

Graduate study in engineering and

science is becoming more recognized as essential in the preparation for the higher posts in industry, professional practice, and research. Advanced courses are offered during evening hours to permit those regularly employed during the day to better their education and to improve their technical ability.

The courses listed will be offered evenings during the year 1933-34 to qualified graduates of universities and colleges who desire to take one or more advanced courses without regard to credit, or who wish to pursue studies for advanced degrees. Other courses, offered on an alternate-year basis, will be given during the year 1934-35.

Registration for the courses begins on September 18 and classes continue through May unless otherwise stated. All classes are held in the Institute Buildings near Borough Hall, Brooklyn.

Day and Evening Curricula are available leading to the Master's Degree in several departments and to the Doctor's Degree in Chemistry. Credit for the courses listed can be applied toward the degrees of: Master of Science and Doctor of Philosophy in Chemistry, Master of Science in Physics, and Master of Chemical, Civil, Electrical or Mechanical Engineering. Tuition fees are for the individual courses only; they range from $20 up.

CHEMISTRY

Advanced Physical Chemistry—Wednesdays and Fridays, 7:45 to 8:45 P. M.

Advanced Physical Chemistry Laboratory—Thursdays, 7:45 to 9:45 P. M.

Catalysis and Thermodynamics—Thursdays, 6:15 to 7:45 P. M.

Advanced Organic Chemistry—Tuesdays, 7:45 to 9:45 P. M.

Chemical Microscopy—Wednesdays, 6:45 to 9:45 P. M.

Advanced Inorganic Chemistry—Fridays, 6:15 to 7:45 P. M.

Laboratory Chemistry of the Less Usual Elements—Wednesdays, 6:45 to 8:45 P. M.

Reading of Chemical German (second semester)—Fridays, 5:45 to 7:45 P. M.

Advanced Organic Analysis—Tuesdays, 5:45 to 6:45 P. M.; Tuesdays and Fridays, 7:45 to 9:45 P. M.

CHEMICAL ENGINEERING

Unit Processes of Chemical Engineering—Tuesdays, 6:45 to 9:45 P. M. and Thursdays, 6:45 to 8:15 P. M.

Chemical Plant Design—Mondays, 6:45 to 9:45 P. M.

Varnish Technology (first semester)—Fridays, 6:45 to 8:15 P. M.

Paint and Pigment Technology (second semester)—Fridays, 6:45 to 8:15 P. M.

CIVIL ENGINEERING

Advanced Structures — Thursdays, 7:45 to 9:45 P. M.; Saturdays, 1:30 to 3:30 P. M.

Bridge Engineering—Mondays and Fridays, 6:45 to 8:45 P. M.

Advanced Concrete Structures—Wednesdays, 6:45 to 8:45 P. M.

Advanced Highway Engineering—Tuesdays, 6:45 to 8:45 P. M.

ECONOMICS

Engineering Economics—Tuesdays, 7:45 to 9:15 P. M.

Accounting and Financial Aspects of Business—Mondays, 6:15 to 7:45 P. M.

ELECTRICAL ENGINEERING

Advanced Circuit Theory—Fridays, 7:45 to 9:45 P. M.

Electromagnetic Theory—Tuesdays, 7:45 to 9:45 P. M.

Power Transmission and Distribution Theory—Mondays, 7:45 to 9:45 P. M.

Electrical Protection in Power Systems—Fridays, 7:45 to 9:45 P. M.

Theory of Vacuum Tubes and Their Circuits—Mondays, 6:45 to 8:45 P. M.

MECHANICAL ENGINEERING

Graphical Analysis of Machines—Fridays, 6:45 to 8:45 P. M.

Kinematics in Machine Design—Thursdays, 7:45 to 9:15 P. M.

Stress Analysis in Machine and Structural Elements — Wednesdays, 6:45 to 8:45 P. M.

Advanced Thermodynamics (first semester)—Mondays, 7:45 to 9:45 P. M.

Heat Power Engineering (second semester)—Thursdays, 7:45 to 9:45 P. M.

Industrial Metallurgy — Thursdays, 6:45 to 8:45 P. M.

MATHEMATICS

Advanced Calculus—Tuesdays, 7:45 to 9:45 P. M.

Differential Equations—Wednesdays, 7:45 to 9:45 P. M.

Vector Analysis—Tuesdays, 7:45 to 9:45 P. M.

Higher Mathematical Analysis—Thursdays, 7:45 to 9:45 P. M.

PHYSICS

Advanced General Physics—Mondays, 6:45 to 8:15 P. M.

Theory of Relativity—Tuesdays, 6:15 to 7:45 P. M.

Modern Physics—Mondays, 6:15 to 7:45 P. M.

Physical Measurements—Mondays, 6:00 to 10:00 P. M.

Optics—Thursdays, 7:45 to 9:15 P. M.

For catalogue and further information on graduate courses, address Dean Erich Hausmann, Polytechnic Institute of Brooklyn, 99 Livingston Street, Brooklyn N. Y. Telephone—TRiangle 5-6920. Catalogues describing the undergraduate courses offered during the day and during the evening are also available.

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CHAPTER NEWS

Raphael J. Smyth, Chairman, Committee on Chapter Activities

WESTCHESTER COUNTY

Most inclement weather did not prevent one hundred and twenty-five Engineers and Architects from attending the first meeting of the 1933-34 season of the Westchester County Chapter which was held at the County Court House on September 19th. This large gathering,—composed of representatives of the Westchester County Society of Civil Engineers, of the Chapters of The Bronx, New York, Suffolk and Westchester Counties, and of Architects and non-member Engineers, assembled to consider the National Recovery Act and the codes of fair competition which have been prepared under it for the Construction Industry and also for the Engineering Profession insofar as it is functional thereto.

Mr. A. L. Raffa,—Professor of Economics at Georgetown University, National Field Coordinator and a member of the Bureau of Public Speakers of the National Recovery Administration at Washington,—attended the meeting in response to a request for a speaker which had been made to Gen. Hugh S. Johnson, by the Chapter. Mr. Raffa gave a very clear resume of the birth and growth of the N. R. A. idea, of the policies which have been established by the Act, of the various codes which have been prepared under the Act and which are under consideration or in force, and of the intended and expected effect which the codes will have in eliminating unfair competitive practices, in increasing purchasing power, in relieving unemployment, and in generally improving living standards.

Mr. Arthur V. Sheridan, past president of the Society and one of its representatives on the committee which prepared the Code which has been established for the Engineering Profession by the American Society of Civil Engineers, discussed the Engineers' Code. He gave an authoritative exposition of it having been principally responsible for many of its provisions. It was explained by him that the Code had been necessarily rather hurriedly drawn and it was urged that if, upon study, modifications appeared desirable, suggestions for improvements be made as expeditiously as possible. The address was most instructive and was delivered with great clarity and detail. Mr. Sheridan was given a rising vote of thanks at its conclusion.

The following committee was appointed to make an analytical study of the proposed Code and to report upon it at a special meeting which will be held on September 28th: Ben H. Krey, Chairman, Pleasantville, representing employing engineers; Joseph Brady, Katonah, representing the public works' employee; George E. Wright, Larchmont, representing the private employee; Edward Applebee, Ossining, and Walter A. Miles, Mount Vernon, representing the employing private Land Surveyors.

Mr. John Avery, President of the Chapter, in his report, advises that Mr. John E. Anderberg, Division Engineer of the Westchester County Park Commission and an active member of Westchester County Chapter, has been appointed as Assistant to Arthur S. Tuttle Chief Engineer of the National Works Administration of New York State. The members of the State Society congratulate Mr. Anderberg upon his appointment to this position of high responsibility and authority, and extend to him cordial good wishes for success.

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CHAUTAUQUA-CATTARAUGUS COUNTIES

The Chautauqua-Cattaraugus Counties Chapter held a meeting on September 13th in the Club Room at the Administration Building in Alleghany State Park. The use of the meeting room was secured through the courtesy of Mr. Haley, Secretary of the Alleghany State Park Commission.

Announcement was made that the following Engineers had been accorded the honor of being formally recorded

as the Charter Members of the Chapter:

Calvin Eugene Bentley, Frank A. Gugino, John M. Hackett, Harvey H. Johnson, Charles G. Locke, Richard B. Lyon, Gilbert R. Miles, Walter J. O'Brien, George L. Purdy, M. H. Regan, Walter F. Shaw, Richard B. Terry, W. H. C. Thyng, Walter E. Wanner, William D. Zielley.

At the conclusion of the business meeting the Engineers were regaled with a refreshing repast and then entertained for an hour by talented members of the C. C. Camp, which is located in the State Park.

Mr. R. B. Lyon, Secretary-Treasurer of the Chapter, reports that the next Chapter meeting will be held in Olean on October 7th. Previous to the meeting the members will make an inspection tour of the Socony-Vacuum Oil Refinery under the guidance of Mr. Walter E. Wanner, Assistant Superintendent of the plant, and a member of the Chapter.

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ST. LAWRENCE-FRANKLIN-CLINTON COUNTIES

The St. Lawrence-Franklin-Clinton Counties Chapter held its first meeting of the season at the Clarkson College of Technology, Potsdam, on Saturday afternoon, September 16th. It was attended by fifty-two members and guests, among whom were E. S. Cullings and A. H. Emerson, President and Secretary, respectively, of Jefferson County Chapter, Dean Frederick C. Wilson, Dr. Charles Hecker, Professors A. R. Powers, Carl Maylott, Jess H. Davis, and T. L. Hamlin of Clarkson College. A number of younger Engineers — prospective licensees—were interested visitors.

The guest-of-honor and principal speaker of the occasion was Mr. Arnold G. Chapman, President of the New York State Society. Mr. Chapman described the remarkable growth, in numbers and influence, of the Society during its short existence. He reviewed its splendid accomplishments in perfecting those statutory laws which govern the practice of Engineering in this State and made cordial acknowledgement of the admirable support rendered by the many engineering organizations which assisted in that work. And he reported with evident satisfaction the zealous endeavors which are now being made by the Society to speedily effectuate the purposes of the National Recovery Act. Mr. Chapman's address aroused keen interest and was vigorously applauded.

Mr. A. E. Bartlett, President of the Chapter, reports that the success of the meeting was most encouraging and that it presages a spread of interest among the Engineers of the northern counties in the work of the State Society.

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NEW YORK COUNTY

Mr. H. G. Balcom, President of the New York County Chapter, reports that Chapter meetings will be resumed in October.

The Code Committee has been extremely active during the summer preparing an Engineers' Code to supplement the Construction Industry Code under the N. R. A. This Committee had made considerable progress in its work of codification before the Engineers' Code Committee was created by the American Society of Civil Engineers. These committees have been collaborating and a number of the suggestions of the New York County Committee have been incorporated in the draft of the A. S. C. E. which has been submitted for adoption. Dr. D. B. Steinman and Arthur V. Sheridan, past presidents of the State Society, and Fred. H. Zurmuhlen, President of the Richmond County Chapter, have attended several of the committee meetings.

The Charter Revision committee has submitted the following interesting report:

Report of Tentative Committee on Charter Revision of the City of New York.

On the invitation of H. G. Balcom, President of the New York County Chapter, three of the five Metropolitan County Chapters responded with representatives at a meeting held on August 16th at Headquarters in the Grand Central Terminal Building to discuss and formulate ways and means to protect public welfare by increasing the engineers responsibility in departments distinctly engineering in any proposed new charter for the City of New York.

Attending the meeting were: H. G. Balcom, Maurice Goodman, T. Hayden Hamilton, New York; J. Franklin Perrine, William Bertram, Frank Lillian, George P. Winn, Queens; J. F. Badeau, Walter E. Addicks, Charles Schaefer, Jr., and Charles F. Giraud, Bronx. Mr. Balcom opened the meeting and Mr. Perrine was elected temporary chairman with Mr. Bertram acting secretary.

High lights resulting from informal discussion at this meeting were:

1. Neither the present Charter nor those being proposed recognize the necessity of engineering knowledge on the part of those in responsible charge of the many engineering departments constituting the City Government.

a. Doctors must be responsible for Public Health, Hospitals, etc.

b. Lawyers must be responsible in office of Corporation Counsel, law departments, etc.

c. Politicians, layman or lawyer, maybe and with rare exception, are responsible for engineering departments where the same technical requirements and standards should exist in selecting competent officials as do those for departments of medicine or law.

2. Present organized movements toward charter revision provide the engineer an exceptional opportunity to call public attention to this present ridiculous situation. This responsibility rests with the Metropolitan Chapters of the State Society.

3. Procedure in taking advantage of this opportunity:

a. Each Chapter to appoint a committee to study and draw up a complete charter, Bronx and Queens have already done so.

b. Representatives of each of these five commitees to form a Metropolitan Committee to draw up a final charter based on the five separate studies.

c. Representatives of the Metropolitan Committee, qualified by intensive study and selected for ability, to appear at open meetings of organizations concerned with charter revision to enforce recognition for the engineer where it is due in any new charters.

4. Powerful forces will oppose and very likely defeat any attempt to adopt a new charter. However, the time and the effort put forth by the Metropolitan Committee will serve in any case to call attention to obvious weakness of permitting control of engineering departments by laymen, as now under exisiting charter, and will further serve to focus attention on a profession practically unknown and neglected in the public mind.

5. The ultimate purpose of this meeting is protection of the public welfare in demanding engineers in positions of responsible authority in City Engineering Departments in any charters that may be presented for public consideration.

Be it resolved: that a report of this meeting of the Tentative Committee on Charter Revision of New York City here assembled at Headquarters of the N. Y. State Society of Professional Engineers, Grand Central Terminal Building, New York, August 16, 1933, be forwarded to each of the five Metropolitan Chapters;

That each Chapter appoint a committee to draw up a charter from which a joint committee will be formed to draw up a final charter;

That Joint Committee be responsible for considering and prosecuting ways and means to promote public welfare in promoting engineers to positions of responsibility in engineering departments in any proposed charters for public consideration.

Reported by
T. Hayden Hamilton.

* * *

ORANGE COUNTY

Mr. H. L. Felch, Secretary of the Orange County Chapter, has submitted an interesting supplementary report upon the joint outing of the Rockland, Ulster, Dutchess and Orange County Chapters which was held at Kristic's Farm Inn at Rosendale.

The outing, with its usual enjoyable sports, concluded with a splendid dinner at which eloquent post-prandial addresses were delivered by the following distinguished guests: G. W. Codwise, President, Ulster County Chapter; George Hutchinson, President, Orange County Chapter; Oscar A. D'Luhosch, President, Dutchess County Chapter; H. C. Carpenter, Past President, Orange County Chapter; H. B. Coleman, Vice-President, Dutchess County Chapter; William Blake, City Manager of Newburgh; Charles R. Woodhull, City Engineer of Newburgh; J. F. Loughran, Superintendent of Highways, Ulster County; Calvin T. Allison, Superintendent of Highways, Rockland County; D. V. Z. Bogert, New Paltz.

The affair was so successful that the four participating Chapters unanimously agreed to make it a permanent annual institution.

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BRONX COUNTY

The first regular meeting of the Bronx County Chapter during the 1933-34 season was called to order by President Joseph F. Lamb, at the Concourse Plaza Hotel, September 7, 1933.

Commissioner John Stratton O'Leary of the Tri-Borough Bridge Authority delivered an interesting account of

the progress of the construction of the bridge and advised that Edward J. Byrne, Chief Engineer of the Department of Plant and Structures, had been appointed as Chief Engineer of the Tri-Borough Bridge Authority. Appreciation of Commissioner O'Leary's informative address was acknowledged by a rising vote of thanks at its conclusion.

The Chapter empowered its president to proceed in an endeavor to establish a Metropolitan Conference of the five (5) County Chapters in New York City for co-operative effort in the advancement of matters of common interest.

Mr. Arthur V. Sheridan, Editor of the American Engineer, made a notably able report on the Engineers' Code which had been formulated by the American Society of Civil Engineers. Subsequent to the meeting the following members were appointed to serve on an Engineers' Code Committee: Raphael J. Smyth, Chairman; Arthur V. Sheridan, Martin M. Corry, Abraham Slavin, John H. Knight and Charles F. Giraud.

On August 29th the chapter held an outing at Milton Point, Rye. The principal and final event of the day was the dinner and dance which was held at the Milton Point Casino. After dinner speeches were delivered by James J. Lyons, designee for the office of Borough Presidency; Joseph F. Lamb, President of the Chapter; John Avery, President of the Westchester County Chapter; Fred H. Zurmuhlen, President of Richmond County Chapter; Arthur V. Sheridan, Past-President of the State Society; and Raphael J. Smyth, Past-President of the Bronx County Chapter. Raymond J. Van Wagner, Chairman of the Outing Committee, acted as Toastmaster.

An interesting movement is being developed by Professional Engineers in Bronx County which has no official connection with the Chapter. It is the formation of a non-partisan Professional Engineers' Committee in support of the candidacy of James J. Lyons, a nominee of one of the major political parties for the office of the Presidency of the Borough of The Bronx. Lawyers have long been accustomed to form non-partisan committees in suport of various candidates for public office, especially the judiciary, and the Society has advocated the active participation of Engineers in community life as citizens particularly well equipped to aid in the establishment of good government and in the advancement of the public good. This movement harmonizes with these principles and the effect produced by this novel organized endeavor by Engineers will be observed with absorbing interest.

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RICHMOND COUNTY

The Richmond County Chapter held its opening meeting of the business season in the Public Museum, St. George, on September 14th.

George Allison, Chairman of the Zoning Committee, reported that maps of the Zoning Plan would be ready for consideration about Nov. 1st and that final maps will be completed shortly after January 1st, 1934,

The Public Relations Committee reported that twelve (12) individuals and firms which had been illegally using the designation "Engineer" have, upon receipt of representations by the Chapter, adopted substitute terms descriptive of their services.

A resolution was adopted requesting the National Works Administration of New York State to establish a requirement that residents of New York State, only, be employed upon public works which are financed with Federal aid.

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RENSSELAER COUNTY

Mr. James M. Caird, of Rensselaer County Chapter, has reported that a dinner-meeting of the Chapter will be held at the Troy Club on October 17th.

Mr. Arnold G. Chapman, President of the State Society will be the guest-of-honor at the meeting.

Mr. Gustave W. Paulson, P. E., will deliver an illustrated lecture on "A trip through Sweden."

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Charges For Engineering Services

(Continued from Page 11)

tract, this increased service and consequent cost are considered in fixing the percentage rate.

g.—For intricate engineering or highly specialized work, the percentage rates are higher than those quoted.

h.—The quoted rates may be decreased for work of such simple character that the engineering service may be reduced.

METHOD 2: FIXED LUMP-SUM FEE

(*a*) For complete service, inclusive of assistance and overhead.

(*b*) For personal service only.

(*c*) For personal or complete serice for a limited stated period, with per diem charges added beyond the time limit.

The "lump-sum" fee method at times has some advantage, usually to the Client. It enables a Client to know the cost of engineering service in advance, but it introduces difficulties and unfairness to the Engineer if the original project is modified or if the work is protracted over a period longer than first contemplated.

Therefore, in service of this kind, the agreement or contract should provide:

a.—For payment, based on a per diem basis, for services beyond a specified period.

b.—For added payments, in case the original project is expanded.

c.—For reduction in payment in case the conditions are the reverse of those described under Class 2 (*a*) and Class 2 (*b*).

METHOD 3: PER DIEM RATE

(*a*) For complete service, inclusive of assistance and overhead.

(*b*) For personal service only.

(*c*) For either Class 3 (*a*) or Class 3 (*b*) with an agreement for a minimum guaranteed total payment.

The per diem basis of computing professional fees is peculiarly adapted to work involving irregular personal service and is quite generally used.

The application of the method varies greatly among different engineers according to experience, nature of the services, and locality, which makes necessary a clear agreement beforehand.

Court Work.—

The per diem method is commonly used in Court proceedings. As the fees for expert witnesses may be required on a per diem basis and may be further limited in amount by law, there are times when a lump-sum payment and retainer is necessary in addition to the per diem fee for attendance in Court. The following points should be observed in this class of work:

a.—The full per diem rate is payable for any part of a day that attendance is required in Court, whether or not there is call for attendance as a witness.

b.—The per diem rate is payable for the days or parts of days, engaged with Counsel or Client in preparation of the case.

Professional Advice.—

The per diem basis may result in gross injustice to the Engineer when only personal advice is required. In order to ensure adequate recompense, for the benefits of long experience and profound engineering knowledge, a fair minimum total fee may be required. For example, the particular knowledge or experience of an Engineer may be of great value in a lawsuit, and appearance as an expert to give testimony may be limited to a very short period. Such services are not furnished at the usual per diem rate, and the amounts charged bear relation to the value of the advice.

Minimum Guaranteed Payment.—

In consulting practice, particularly when the personal service to be rendered is likely to be irregular, the per diem basis is quite commonly used, with a guaranty of a minimum payment, either for the complete job or per annum.

The per diem rates follow the general recommendations outlined, dependent on the experience and responsibility involved and the importance and magnitude of the work.

The "up-set" minimum must depend on mutual agreement and is based on considerations of the kind and value of the service to be rendered.

A suitable method, in some instances, is an arrangement for a reasonable annual or monthly salary or retaining fee, and thereafter a superimposed rate per diem fee for days actually worked (See "Method 6: Retaining Fees.")

METHOD 4: HOURLY BASIS

(*a*) For complete service, inclusive of assistance and overhead.

(*b*) For personal service only.

(*c*) For either Class 4 (*a*) or Class 4 (*b*), with an agreement for a minimum total payment.

Some work requires personal service at quite frequent intervals but only of short duration. In such work, an Engineer may carry on a number of engineering commissions simultaneously. Under such conditions, a fee based on hourly service may be equitable.

It is also fair to pay a retaining fee in addition to the payments on the hourly basis, or else to expect it to be stipulated that the aggregate shall be not less than an "up-set" minimum, depending upon the magnitude and duration of the work.

Rates for services on an hourly

basis are higher than would be represented by a full per diem rate for similar work.

In computing hours of employment, the time occupied in going to and returning from the office and the work is included.

Method 5: Salary for Part-Time Service

Salaried service may avoid any unfairness to Engineer or Client that might be involved in the use of either per diem or percentage methods of computation.

It places on the Client all responsibility for delays in developing or completing a project, and in case of protracted litigation, the burden of delays and increased costs falls on the Client, whether or not those delays may be his fault.

This method may be reduced to monthly or yearly remuneration, depending on the magnitude of the work, but in any case the payment for engineering services must be based on the probable extent of the service required and on the cost of overhead and other expenses.

This method may also be used for personal service only, with an agreement as to reimbursement of expense and assistance.

If optional termination of engineering service is required, a penal condition should also be provided to correspond.

Method 6: Retaining Fees

The use of a retaining fee as part payment for engineering services is highly recommended.

It is not fair to utilize an Engineer's services for advice on a project, in the expectation of not paying anything for those services other than the prospect afforded him of a later engagement in competition with other engineers.

The retaining fee provides a recompense in such a contingency. It should be substantial, consideration being given the magnitude and kind of work.

If the project matures and is built, it is common practice to have the retaining fee absorbed into the general total payments for complete service.

Method 7: Contingent Fees

The method of computing compensation by contingent fees is not generally recommended.

It is difficult to compute recompense for professional service contingent on the benefits accruing from engineering service.

This method requires contractual relations that will disclose clearly the basis on which such contingent fees will be ultimately computed.

Overhead

Overhead represents the cost of conducting an engineering business. It includes engineering assistance, office and travel expense, and other items requisite to the conduct of the particular business of a Client. It is an expense for which the Client must pay, either directly or indirectly.

Arbitrations

The services of engineers are often required in the arbitration of disputes. It is desirable to consult the American Arbitration Society as the Courts in most States, where arbitration is accepted in lieu of legal proceedings, have rigid requirements as to conduct.

The usual fee paid to an Arbitrator is $50 per diem. However, with cases involving large sums of money, it is customary for the parties to the proceedings to agree in advance on the rate of compensation. This may be fixed at $100 to $200 or more per diem, depending on the experience and standing of the Arbitrator.

These rates apply to cases on which three Arbitrators are acting. In cases where a single Arbitrator acts, the rates are higher.

In cases of three Arbitrators, in which two Arbitrators are *ex parte* representatives of the two sides concerned and select a third as an umpire, the third Arbitrator is entitled to a higher rate for his services than the two first named. The amount of this fee should be settled in advance.

The full per diem rate is payable for any part of a day considered as a session, in the hearing and consideration of a case.

Valuation and Appraisal of Properties

In valuation and appraisal, there is a great range in the work involved and the proper charges therefor. In some instances there are no inventories, surveys, or information regarding the properties, and the field work involves large expense.

Therefore, before entering into a contract for service, it is necessary to ascertain the conditions and to segregate as well as possible personal service from overhead expense.

It is customary to render personal service on a per diem basis (see "Method 3: Per Diem Rate") and to bill all overhead charges and expense, plus a suitable surcharge previously agreed upon.

The rates should reflect the magnitude of the undertaking and the standing of the Engineer.

In some instances, remuneration may be computed as a percentage of the value of the properties. This method requires a careful estimate of the probable services, plus the cost of assistance and overhead expense, as well as the approximate value of the properties.

A commonly accepted fee for preparing an appraisal of engineering properties is $3.00 per $1,000 for the first $1,000,000 and a somewhat lower rate, as agreed upon, for values in excess.

For the appraisal of industrial properties the usual fee varies from $2.50 to $3.00 per $1,000, depending on the size of the property.

In the appraisal of small properties or engagement for statistical or rate purposes, the ordinary percentage rates may be inadequate, whereas the engineering service rendered may be of relatively great value. In such cases, it is equitable to arrange for remuneration at the normal rates, with a contingent fee or added payment, based on the results to the Client.

Building Construction

The modern building is a structure of which the engineering problems and solutions are of major importance. Engineers specializing in building construction:

a.—Are engaged by the Owner to take entire charge of, and responsibility for, the planning, designing, and construction of a building, Architects being employed on the architectural and decorative features.

b.—Are engaged by the Owner or an Architect for the engineering and design features.

In the building field as in others, the fees depend on the magnitude of the work, the difficulty and elaboration involved, and the responsibility assumed.

For complete charge of and responsibility for the plan, design, and construction of buildings of great magnitude, of simple type and detail, the rate on a "percentage of cost" basis is 5 per cent. For normal type buildings the rate is 6 per cent. For buildings involving complicated problems and elaborate detail the rate ranges from 6 to 10 per cent.

If engineering services are engaged by the Owner or Architect for certain specified features, the extent of such service, conditions of employment, and responsibility for the work are specified in the agreement.

As engineering service may extend to electrical and mechanical equipment, ventilation, study of vibrations, drainage of the soil, foundations, etc., the normal rates for engineering service are not applicable in the field of building construction. A special classification is necessary.

Methods of Computing Fees

Engineering service on buildings may usually be carried out under one of the following methods:

a.—Personal service.

b.—Lump-sum for complete work.

c.—At an agreed rate per ton of steel erected.

d.—A percentage of cost as later defined.

e.—Actual cost of work, plus agreed overhead, plus personal remuneration (profit).

The method of calculation to be used is that which lends itself most conveniently to the conditions of work or service, and yields the most equitable result. There should be clear understanding of what is, and what is not, to be included in the work.

Under any of the methods given, engineering employment should include responsibility for:

The designs to the point of furnishing full information from which the fabricating contractor can prepare details.

The checking of all shop details to insure compliance with the specifications.

Inspection of foundations, steel erection, and other construction designed by the Engineer.

It is recommended also that the agreement should include preparation of shop details so that bids on the fabrication will be made on the same finished material and not on dissimilar details and construction.

Unless otherwise definitely agreed, the Engineer is not responsible for mill or shop inspection of steel fabrication.

a.—Personal Service.—

Compensation for personal service, consisting of engineering advice or

consultation, may be made either on a "per diem" basis or a percentage rate. Information on per diem rates for general engineering service is given under Method 3.

Percentage rates for consultation service that is to continue throughout construction, range from 0.75% to 3% of the total cost of the work on which advice is given. The rate depends on the importance of the service, the difficulties of the design or construction, and the value of the advice to the Client.

b.—Lump-Sum for Complete Engineering Work.—

The "lump-sum" arrangement for engineering service requires intimate knowledge of the work to be done and the probable difficulties, and may be used advantageously by engineers of wide experience.

When this method is used it must carry with it full responsibility on the Engineer for the design and conduct of the work, particularly in reinforced concrete buildings.

c.—Tonnage Method.—

A rate per ton of steel designed and erected (2,000 lb.) is the usual basis for assessing charges in building construction.

This method includes full professional responsibility for the design and for the checking of shop plans submitted by the fabricator.

Unless agreed upon specifically, the rates do not include superintendence, supervision, or inspection of the erection work. The erection work should be within the responsibility of the designing engineer, and the usual rate is increased to cover this added cost, if included.

The rates vary from $1.00 to $4.00 per ton, depending on the kind and type of building.

A rate of $2.50 per ton represents a fair compensation for complete service for a reasonably simple type of building of large and heavy tonnage.

d.—Percentage of Cost.—

There are two methods of computing charges on a percentage basis:

First Method.—For a normal type large steel-framed office or store building, the charge should approximate 2½% of the cost of the work designed, exclusive of supervision of construction.

For light-weight steel design, difficult truss construction, etc., the charges approximate 4 per cent.

For alterations involving difficult engineering problems and details, the charges range from 6% to 10% of the cost of the work.

For alterations to structures, the engineering compensation may also be computed at three times the estimated or actual cost of the salaries of the designing engineers and draftsmen engaged on the work.

For ordinary foundations, where no further engineering services are rendered, the charges range from 2% to 4%, depending on the probable cost and the type.

Tables 2 and 3 give percentage rates for engineering service in the design and construction of structural steel work for buildings.

Charges for the detailing of structural steel work are more usually based on a price per ton of steel than on the rates in Table 3.

(Rates between given limits to be determined by the judgment of the Engineer. Percentages are based on cost of steel erected, assumed for maximum classification as $125 per ton, and for minimum classification as $70 per ton. Rates include design and plans, location of column centers, specifications, and checking only in respect of adequacy and strength of Contractor's working or shop drawings, and control points for location of all steel.)

TABLE 2.—STRUCTURAL STEEL CONSTRUCTION, GENERAL PRACTICE: RATES RECOMMENDED FOR CHARGES AS A PERCENTAGE OF THE COST OF THE WORK.

Total cost of structural steel.	Limits of Rates, in Percentage.	
	Maximum (for theatres, churches, etc.)	Minimum (for business buildings*).
$ 10 000 to $ 50 000	6.50	3.50
$ 50 000 to $ 100 000	6.25	3.38
$ 100 000 to $ 200 000	6.00	3.25
$ 200 000 to $ 300 000	5.75	2.88
$ 300 000 to $ 500 000	5.50	2.63
$ 500 000 to $1 000 000	5.25	2.38
$1 000 000 and more	5.00	2.25

* Subjected to live loads of more than 120 lb. per sq. ft.

TABLE 3.—STRUCTURAL STEEL CONSTRUCTION, DETAILED SUPERVISION: RATES RECOMMENDED FOR CHARGES AS A PERCENTAGE OF THE COST OF THE WORK.

Total cost of structural steel.	Limits of Rates, in Percentage.	
	Maximum (for theatres, churches, etc).	Minimum (for business buildings*).
Less than $ 50 000	10.5 to 13	5.5 to 7.5
$ 50 000 to $100 000	9.5 to 11.5	4.5 to 6.5
$100 000 to $200 000	8.5 to 10.5	3.5 to 5.5
More than $200 000	7.5 to 9.5	2.5 to 4.5

* Subjected to live loads of more than 120 lb. per sq. ft.

(Rates between given limits to be determined by the judgment of the Engineer. Percentages are based on cost of steel erected,-assumed for maximum classification as $125 per ton, and for minimum classification as $70 per ton. Rates include shop details of structural steel, complete erection plans, material orders, shop details of all material, and shop bills. Rates do not include mill, shop, or field inspection).

Second Method.—The second method of computing charges on percentage rates is based on the total cost of the building.

The following rates are recommended:

(*a*)—For office and loft buildings, about 0.5% of the total cost, with allowable variation based on the simplicity or difficulty of the job.

(*b*)—For theatre, auditorium, and such work, involving more difficult design, 1½%, or more, of the total cost.

The following alternative is also used:

For hospitals, schools, apartments, office, and similar buildings, 3% of the cost of all structural or engineering work, inclusive of overhead and profit, plus 0.2% of the total cost of the building.

For factories, warehouses, and similar buildings, 3% of the cost of all structural work, inclusive of overhead and profit, plus 0.5% of the total cost of the building.

The charges named in the foregoing methods do not include the expense for superintendence, for mill and shop inspection of steel, and for inspection during erection.

For shop and mill inspection the following rates are recommended:

On the smaller jobs, the usual charge is $2 to $3 per hour plus travel expenses, for such time as the Inspector is on the job.

For buildings in which steel exceeds $200,000, charges are generally based on a rate of approximately 75 cents per net ton of steel fabricated (representing 25 cents per ton for mill inspection and 50 cents per ton for the shop fabrication).

For buildings in which the steel costs less than $50,000, the approximate rates per net ton are: Mill, 40 cents; shop, 60 cents; making a total of $1.00 per net ton.

For heavy bridge work, the usual rate for mill and shop inspection is $1.00 per ton.

Charges for inspection during erection include the salary of an Engineer Inspector (about $300 per month) and running expenses. If the charges are based on tonnage, the rates range between 50 cents and 65 cents per ton of fabricated steel.

For complete inspection in mill, shop, and field, it is equitable to reduce the aggregate of the unit costs itemized by 10% to 20%, depending on the magnitude of the job.

e.—Cost Plus Basis.—

This method is satisfactory on building construction if all parties to the transaction have confidence in each other. It is particularly applicable in the preliminary stages of a project. The charge is computed by adding together the cost of time of principals and assistants, overhead, and remuneration.

In drawing an agreement on the cost-plus basis, it is essential to state the unit charges and the rates for personal remuneration of principals.

The accounting under this method follows the principals of general engineering service. (See "Method 1: Percentage of Cost.") The charge for overhead ranges from 75 to 100 per cent.

FOUNDATIONS

Any of the methods outlined for general engineering service may apply for the design and construction of building foundations.

With the "percentage of cost" method, the usual fee is 3% to 4% of the total cost, including the cost and expense of excavation of soil on the building site.

For difficult foundations, involving

caisson construction, bracing, shoring, underpinning, etc., the rate is higher, depending on the magnitude of the work and the difficulties.

The fee includes the services of the Engineer and his expert assistants in general supervision of construction from start to finish.

It does not include, unless specifically agreed, the detailed daily inspection of work, which is paid for at cost by the Client.

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Staten Island, N. Y.
Brooks, Josiah A.
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Callan, Philip J., Jr.
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Chamberlin, George E.
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Curtis, Lester R.
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Davis, Calvin V.
Westfield, N. J.
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Dixon, Leon S.
Bangor, Me.
Driscoll, John M.
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Eagar, Robert J.
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Edelstein, Herbert E.
New York, N. Y.
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Erickson, Archie M.
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Fielder, Walter G.
DeWitt, N. Y.
Fink, John C.
Rutherford, N. J.
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Poughkeepsie, N. Y.
Fuller, Howard C.
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Griffeth, Earl L.
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Harnden, Harvey A.
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Homburger, Henry A.
Saranac Lake, N. Y.
Hyatt, Louis C.
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Hyatt, Wm. C.
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E. Orange, N. J.
Kane, Laurence J.
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Knecht, Andrew W., 2nd
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Rockville Centre, L. I.
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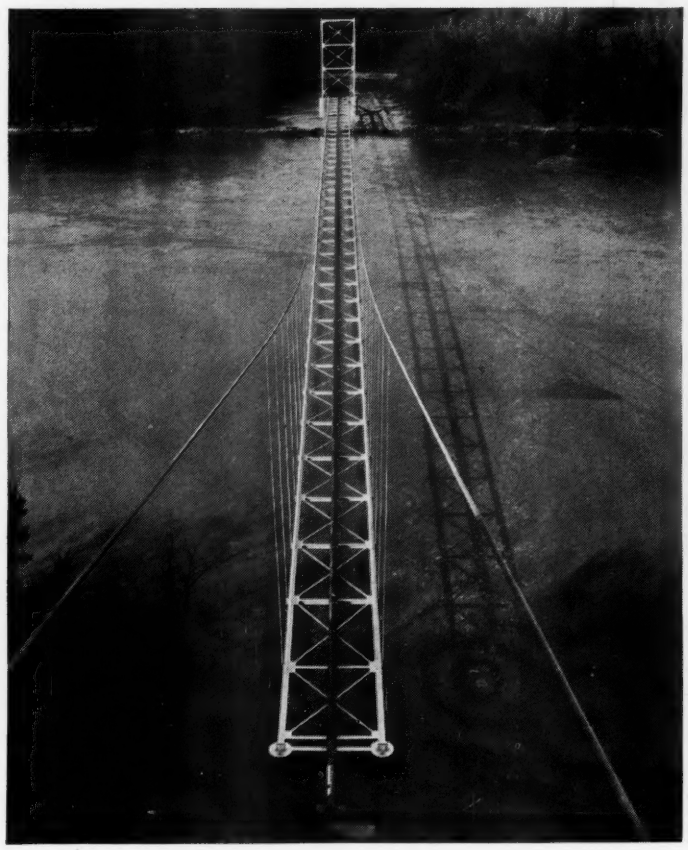

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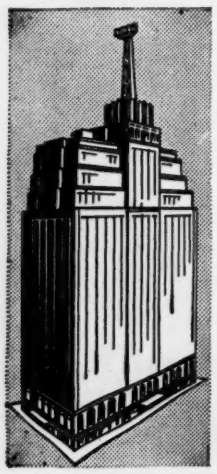

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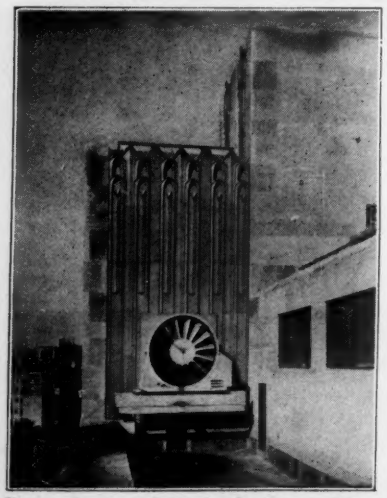

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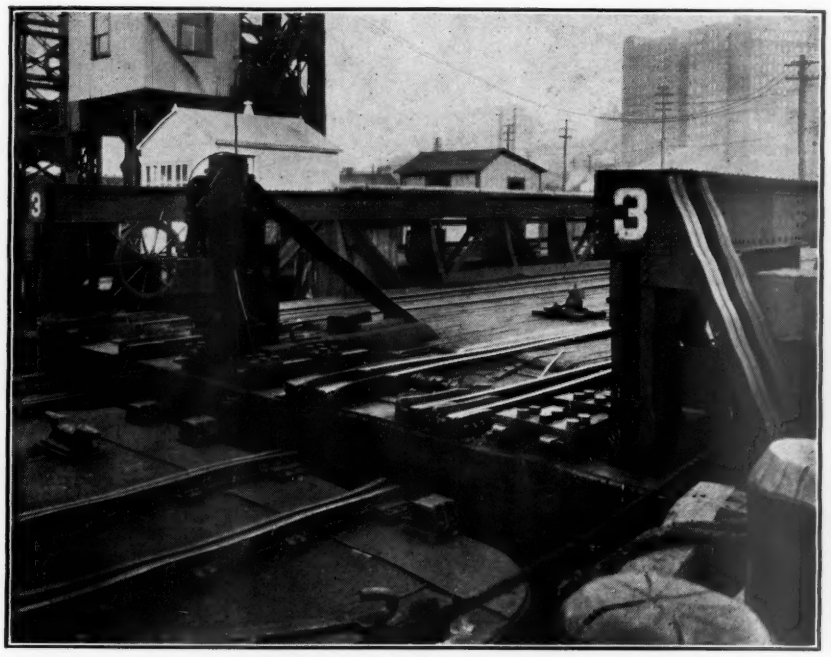

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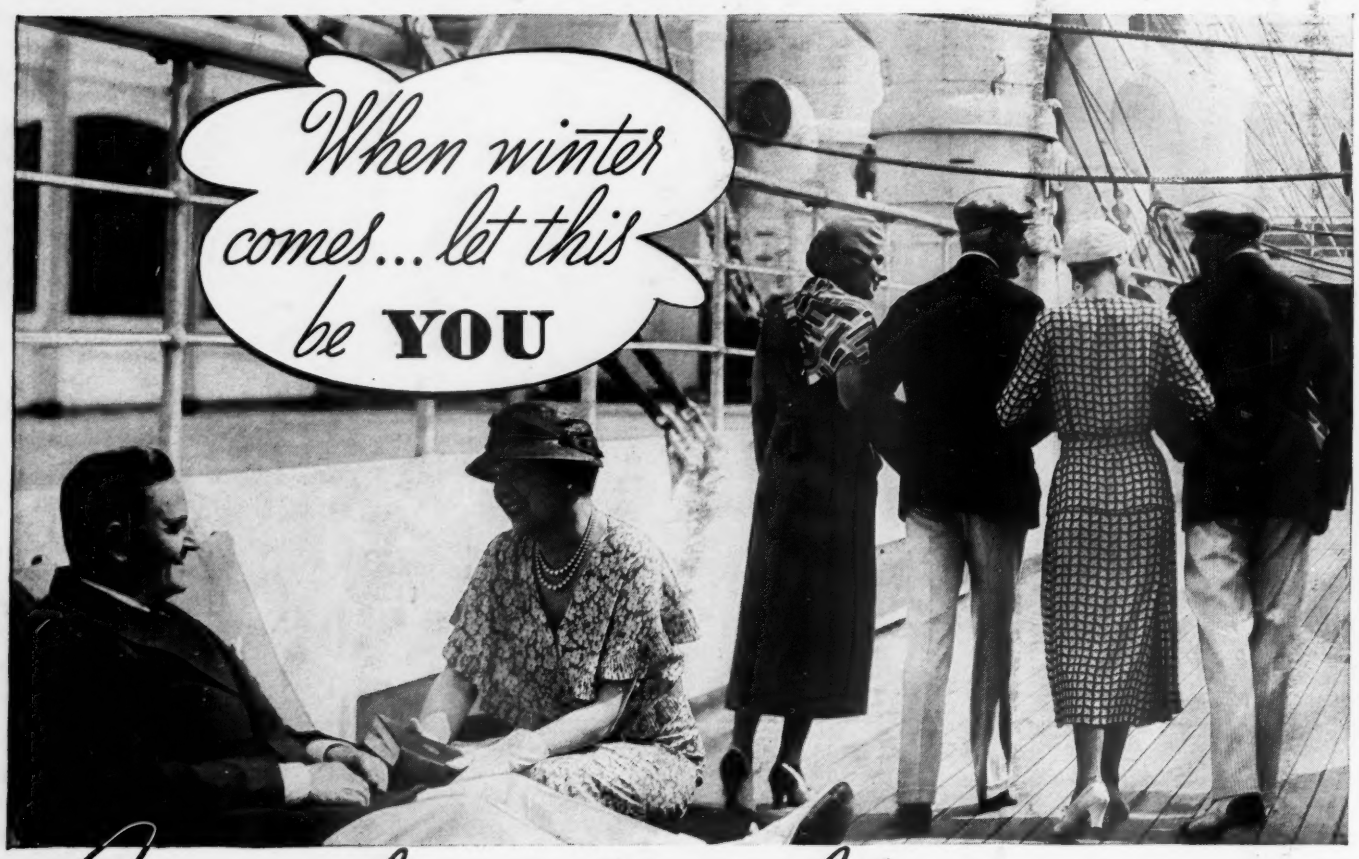

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